COUNTY OF SONOMA

ONSITE WASTEWATER TREATMENT SYSTEM REGULATIONS AND TECHNICAL STANDARDS (OWTS MANUAL)

COUNTY OF SONOMA
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Section 1 General

1.1 Purpose

A. The *OWTS Manual* amends in its entirety the *Regulations for Onsite Sewage Dispersal in Sonoma County (November 2002 et seq.)* and is intended to establish conformity with standards for the permit approval, installation, and operation of OWTS within the County. Modifications to County OWTS standards are necessary to update, add and/or replace outdated County regulations and to comply with the State Water Resources Control Board (SWRCB) *OWTS Policy*. These standards are adopted to address the potential creation of health hazards and nuisance conditions, to protect the quality of surface water and groundwater in Sonoma County, and to meet provisions of **Tier 2 Local Area Management Program (LAMP)** requirements of the *OWTS Policy*.

1.2 Authority

A. This *OWTS Manual* provides the regulatory requirements, policy, procedural and technical details for implementation of the Porter Cologne Water Quality Control Act (California Water Code Section 13000 et.seq.), the SWRQB *OWTS Policy,* and applicable sections of Sonoma County Code Chapters 7 and 24. The California Water Code 13282 authorizes counties to adopt and enforce regulations, conditions, restrictions, and limitations regarding the dispersal of waste. The SWRQB *OWTS Policy* authorizes the Regional Water Quality Control Board (RWQCB) to approve a LAMP for the implementation of the OWTS Policy. The Sonoma County Code Chapter 24-31.5 authorizes the Director of the Permit and Resource Management Department (PRMD) to adopt and promulgate standards for OWTS.

1.3 Applicability

A. These standards apply to OWTS, where there is a proposed or existing residence, a place of business or other building or place which people occupy, or where persons congregate, reside or are employed and where the maximum daily flow rate of wastewater produced is ten thousand gallons per day (10,000 gpd) or less.

B. Additionally, review and approval by the RWQCB is required for OWTS in cases where:

1. The maximum wastewater flow rate handled by the OWTS is more than 10,000 gallons per day;

2. The OWTS is categorized as a community system;

3. The OWTS receives high-strength wastewater, unless the waste stream is from a commercial food service building;

4. The OWTS receives wastewater from a commercial food service building: (1) with a BOD higher than 900 mg/L, or (2) that does not have a properly sized and functioning oil/grease interceptor;

5. The RWQCB asserts jurisdiction.

Section 2 Sewer Connection Required

A. Installation of a new or replacement OWTS where public sewer is available is prohibited, except as follows:

   1. This provision does not apply to replacement OWTS where the connection fees and construction cost are greater than twice the total cost of the replacement OWTS and the local agency determines that the discharge from the OWTS will not affect groundwater or surface water to a degree that makes it unfit for drinking or other uses.

B. Sewer is available if:

   1. The subject parcel is within a sanitation district boundary; and

   2. A public sewer is 200 feet, or the distance specified by the respective sanitation district, or less from the proposed or existing structure; or

   3. A lateral sewer connected to a public sewer is 200 feet, or the distance specified by the respective sanitation district, or less from the proposed or existing structure.

Section 3 Definitions

A-BLD means a building permit issued without plans and without formal plan review, although in some cases supporting documents (such as a floor plan or manufacturer's listing documents) may be required. It is not intended that an "A-BLD" permit be issued for any change in occupancy.

Absorption Area means the area(s) of the OWTS dispersal system where wastewater is distributed subsurface for the purposes of final treatment and dispersal. Absorption area is also known as leachfield, drainfield or dispersal area.

Accessory Structure means a residential structure not greater than 3,000 square feet in floor area, and not over two stories in height, the use of which is customarily accessory to and incidental to that of the dwelling(s) and which is located on the same lot.

Addition means an increase in living area square footage to the primary residential dwelling or commercial structure and/or any and all accessory structure(s) either through an expansion of the footprint of the dwelling(s) or structure(s), a second floor addition, a basement addition or the conversion of non-habitable space to habitable or living area use. For the purpose of this policy, a new residential accessory structure will be considered an "Addition" to the primary residential dwelling.

Adjusting Valves means a device(s) used in OWTS to distribute wastewater in a balanced or even flow.

Administrative Authority. See Permitting Authority.

Advanced Treatment Unit means an approved measure that utilizes special designs and/or additional technology to treat the effluent to a much higher level than a conventional system. An approved Advanced Treatment Measure shall reduce BOD and Suspended Solids to less than 30 mg/L and provide at least 50% total nitrogen removal, as verified by an approved independent testing laboratory.

Advanced treatment Unit. See Pretreatment.

Alternative OWTS means an approved non-standard OWTS that has demonstrated in the non- standard Experimental phase to function in such a manner as to protect water quality, preclude health hazards and nuisance conditions and capable of producing an equal to or greater quality wastewater effluent and improved performance of and siting for effluent dispersal than a standard OWTS.

Bedrock means solid rock, which may have fractures, that lies beneath soils and other unconsolidated material. Bedrock may be exposed at the surface or have an overburden up to several hundred feet thick.

Bedroom means any living space in a dwelling unit or accessory structure which is 70

square feet and greater in size and which is located along an exterior wall, but not including the following hall, bathroom, kitchen, living room (maximum of one per dwelling unit), family room (maximum of one per dwelling unit), laundry room, closet/dressing room, opening off of a bedroom. Refer to **Appendix D** (PRMD Policy and Procedure Number 1-4-1, *Definition of Bedroom*) for further information.

B-BLD is a building permit for new additions, remodeling and/or new structures that requires construction plans and plan review. A "B-BLD" is any building permit that does not meet the definition of an "A-BLD" permit. (Section 6: OWTS Requirements for Approval of Building Permits)

Best Available System. See Class I Non-Conforming OWTS.

Best Practical System. See Class II Non-Conforming OWTS.

Bulk Density is the mass of dry soil per unit bulk volume, expressed in gm/cc. The bulk volume is determined before drying to a constant weight at a temperature of 105 degrees.

Cesspool is an excavation in the ground receiving domestic wastewater, designed to retain the organic matter and solids, while allowing the liquids to seep into the soil. Cesspools differ from seepage pits because cesspools systems do not have septic tanks and are not authorized under this Policy. The term cesspool does not include pit-privies and out- houses which are not regulated under this Policy.

Clay means mineral soil particles less than 0.002 millimeters in diameter. It is classified in the USDA Soils Classification Triangle as a soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clothes Washer Graywater System is a graywater system utilizing only a single domestic clothes washing machine in a one or two family dwelling that does not include a cross-connected potable water connection or a pump and does not affect other building, plumbing, electrical, or mechanical components including structural features, egress, fire-life safety, sanitation, potable water supply piping, or accessibility.

Coarse Fragments is rock or mineral particles greater than 2.0 mm in diameter.

Cobbles are rock fragments 76 mm or larger using the USDA soils classification system.

Code Compliant OWTS means a system that is in conformance with this OWTS Manual.

Commercial OWTS is OWTS on a parcel of land that produces a peak daily sewage flow of 1500 gallons per day or more of any wastewater strength or generates a wastewater of any quantity that meets the definition of a high strength wastewater. BOD concentrations up to 900 mg/L are allowed at commercial food service buildings that are equipped with a properly sized and functioning oil/grease separator,

Community System is a decentralized OWTS that serves multiple structures, multiple wastewater discharge sources and/or multiple parcels of land under separate ownership.

Complex Graywater System is a residential graywater system that discharges over 250 gallons per day.

Conditioned Space is any area, room or space in a building being heated exceeding 10 Btu/hr-ft^2 or cooled exceeding 5 Btu/hr-ft^2 directly or indirectly by any equipment or passive design feature for the comfort of occupants or for other reasons such as preserving temperature-sensitive goods.

Cumulative Effects are the persistent and/or increasing effect of individual OWTS resulting from the density of such discharges in relation to the assimilative capacity of the ground environment. Examples include salt or nitrate additions to groundwater, nutrient enrichment of surface water, and hydraulic interference with groundwater and between adjacent systems.

Cut Bank is a man-made excavation of the natural terrain in excess of three (3) feet. Cuts supported by retaining walls or similar structures shall be included within this definition, as shall steep natural ground surfaces where a sharp break in the ground slope is discernible.

Dispersal system means a leach field, seepage pit, mound, bottomless sand filter, subsurface drip, sand fill trench system for final waste water treatment and subsurface discharge.

Domestic wastewater means the type of wastewater normally discharged from, or similar to, that discharged from plumbing fixtures, appliances and other household dishwashing facilities and garbage disposals. Domestic wastewater may include wastewater from commercial buildings such as offices, retail stores and some restaurants. Domestic wastewater may include incidental RV holding tank dumping but does not include wastewater consisting of a significant portion of RV holding tank wastewater such as an RV dump station. Typical domestic wastewater will have a 30-day average concentration of biochemical oxygen demand (BOD) less than 300 milligrams per liter (mg/L) or total suspended solids (TSS) less than of 300 milligrams per liter (mg/L) prior to the septic tank or other OWTS treatment component. Domestic wastewater does not include high strength wastewater or wastewater from industrial processes.

Downslope Property Line is a property line down-gradient from the proposed OWTS.

Drainfield or leach field is a system of rock-filled trenches or beds or infiltration chambers that distribute treated sewage effluent for absorption into the soil.

Dual Drainfield is an effluent dispersal system consisting of two complete primary drainfields connected by an accessible diversion valve and intended for alternating use on an annual or semiannual basis.

Effective Drainfield Depth is the depth of drain rock below the bottom of the drainfield pipe.

Ephemeral Watercourse is a stream or reach of a stream that flows briefly only in response to precipitation in the immediate locality and whose channel is at all times higher than the water table. Any water course that does not meet this definition is to be considered a perennial or intermittent stream for the purposes of the chapter.

Existing Structure is one that has been in recent and continuous service. Any structure not in use within the previous five (5) consecutive years must meet the standards for a new on-site wastewater treatment system that would apply to a vacant lot. Proof of recent and continuous service means providing pertinent documentation that substantiates the use of the property during the period in question. These documents may include, but are not limited to receipts (e.g. PG&E, garbage, and water), business records, County or State licenses and permits, deeds, notarized affidavits and dated photographs. (Section 6: OWTS Requirements for Approval of Building Permits)

Existing Exterior Walls shall be measured at the exterior face of wall at the perimeter of the living area that is lawfully existing. (Section 6: OWTS Requirements for Approval of Building Permits)

Expansion area. See reserve replacement area.

Experimental OWTS means a non-standard OWTS deemed conditionally acceptable by the RWQCB, subject to increased performance monitoring and evaluation, prior to acceptance as an approved non-standard Alternative OWTS.

Field Clearance is a site visit required when PRMD's file information is not sufficient to show that the proposed work will not adversely impact the OWTS. A field clearance is more often needed when an older OWTS predates PRMD's record keeping system. In addition, when there is a lack of information on file for the OWTS, a site visit is necessary to verify that an approved OWTS exists on the property.

Findings Report is an analysis of the OWTS which includes review of PRMD septic file information and a visual inspection of an existing OWTS and/or well for the purpose of providing potential buyers or interested parties with information regarding a particular septic system or well. A Findings Report may be prepared by PRMD staff, an RCE or REHS. (Section 6: OWTS Requirements for Approval of Building Permits).

French Drain. See Intercept Drain.

Graywater is untreated household wastewater that has not come into contact with toilet waste. Graywater includes used water from bathtubs, showers, bathroom wash basins, and water from clothes washing machines and laundry tubs. It does not include wastewater from kitchen sinks, dishwashers or laundry water from soiled diapers.

Graywater System is a system designed to collect graywater and transport it out of the structure for distribution in an irrigation or dispersal field. A graywater system may

include tanks, valves, filters, pumps or other appurtenances along with piping and receiving landscape.

Groundwater is water located beneath the ground surface in soil pore spaces or in the fractures of lithologic formations. Groundwater may be present only seasonally (perched). A unit of rock or unconsolidated deposit is called an aquifer when it can yield a usable quantity of water.

Hardpan is an irreversibly hardened soil layer caused by the cementation of soil particles. The cementing agent may be silica, calcium carbonate, iron or organic matter.

Health Officer refers the Sonoma County Health Officer or his/her designated representatives, for purposes of implementation of these standards; the Director of PRMD is the delegated representative.

High Strength Wastewater means wastewater having a 30-day average concentration of biochemical oxygen demand (BOD) greater than 300 milligrams per liter (mg/L) or total suspended solids (TSS) greater than 330 milligrams per liter (mg/L) or a fats, oils, and grease (FOG) concentration greater than 100 mg/L prior to the septic tank or other OWTS treatment component. BOD concentrations above 900 mg/L at a commercial food service building require permitting through the Regional Board.

Holding Tank is a watertight receptacle used to collect and store wastewater prior to it being removed from a property by means of vacuum pumping and hauling. The use of holding tanks is authorized for limited circumstances, including, but not limited to, for the abatement of health hazards or for certain public use facilities.

Hydrometer Analysis is a test used to determine the grain size distribution of soils passing the No. 200 sieve.

Impaired water bodies means those surface water bodies or segments thereof that are identified on a list approved first by the State Water Board and then approved by US EPA pursuant to Section 303(d) of the Federal Clean Water Act.

Impermeable Soil Layer is any layer of soil having a percolation rate slower than 120 minutes per inch (mpi) at the bottom of the proposed dispersal area or a Zone 4 Soil Texture according to Figure 7.4 which has a high shrink swell potential (Plasticity Index of greater than 20, ASTM D 4318-84).

Incompatible Use is any activity or land uses that would preclude or damage an area for future use as an effluent dispersal site, including the construction of buildings, roads, or other permanent structures and activities that may result in the permanent compaction or removal of existing soil.

Interior Remodel is improvement to the interior of the structure with no removal and/or replacement of the structure.

Intermittent stream is a stream that ceases to flow occasionally or seasonally because

of evaporation and leakage. See Perennial Stream.

Intercept Drain is a trench filled with drain rock that is designed to intercept and divert ambient groundwater with surface discharge via piping to another location. Intercept drains are typically used to dewater areas upslope of a leachfield or a foundation and lower the water table. Intercept drains are also known as french drain or curtain drain.

Leach field. See Drainfield.

Legal Non-Conforming OWTS means an OWTS that was legally permitted, was in compliance with the septic laws, regulations or codes when permitted and has a septic tank and dispersal system.

Limiting Condition is the portion of the soil profile that because of percolation characteristics most restricts the successful operation of a drainfield. A limiting condition would include but not be limited to impermeable soil, semi-permeable soil, expansive clay, fractured rock, consolidated rock, excessive rock content and perched or seasonal elevated groundwater conditions.

Linear Loading Rate is defined as the amount of effluent in gallons applied per day per linear foot of the system (gpd/lf). The design linear loading rate is a function of the rate of effluent movement and the direction of movement away from the OWTS (horizontal, vertical or combination).

Living Area includes all areas of residential dwellings and residential accessory structures including bathrooms, kitchens, closets, utility rooms, hallways and any other area in a building that is designed for human use. New residential rooms above garages and/or other new residential accessory structures on the property will be considered living area**.** Areas such as unfinished attic space, unfinished basements, and garages are not considered living area**.** (Section 6: OWTS Requirements for Approval of Building Permits)

Local Agency means any subdivision of the state government that has responsibility for the permitting the installation of and regulating OWTS within its jurisdiction boundaries; typically a county, city or special district.

Maintenance of a wastewater treatment system shall mean clearing of stoppages in pipes without removing, replacing, or rearranging the pipes or surrounding soils; repairing or replacing non- treatment components of a wastewater system; pumping liquid and solids from, or otherwise cleaning septic tanks and grease interceptors; cleaning sand filters; and cleaning pressure distribution system pumps and piping.

Major Addition is an addition of more than a combined cumulative 640 square feet of living area to the primary dwelling and/or accessory structure with R occupancy sharing a common OWTS. Credit shall not be given for demolished portions of the building when calculating the additional square footage.

Major Rebuild is the removal and/or replacement of more than 50% of the structure.

The percentage is cumulative from the effective date of the ~~previous~~ 2009 Policy and Procedure 9-2-13 Guidelines for Remodeling and Additions with Respect to On-Site Wastewater Treatment Systems.

Minor Addition is an addition of a combined cumulative 640 square feet of living area or less to any primary dwelling and/or accessory structure with R occupancy sharing a common OWTS. Credit shall not be given for demolished portions of the building when calculating the additional square footage.

Minor Rebuild is the removal and/or replacement of 50% or less of the structure. The percentage is cumulative from the effective date of the 2009 Policy and Procedure 9-2-13 Guidelines for Remodeling and Additions with Respect to On-Site Wastewater Treatment Systems.

Modification is a remodel or addition of living area (potentially habitable or not) to an existing structure.

Monitoring Wells are installed to monitor ground water. The construction of monitoring wells must meet California Well Standards and be installed under permit by the State of California or the designated enforcement agency. Monitoring wells are not to be confused with performance wells used to evaluate the efficacy of OWTS in the immediate area. See Performance Wells definition.

Mottles is a soil condition that results from oxidizing or reducing minerals due to soil moisture changes from saturated to unsaturated over time. Mottling is characterized by spots or blotches of different colors or shades of color (grays and reds) and size interspersed within the dominant color as described by the USDA soil classification system. The soil condition can be indicative of historic seasonal high groundwater level, but the lack of this condition may not demonstrate the absence of ground water. Mottling in soils usually indicates poor aeration, periodic saturation, or poor drainage.

New OWTS means an OWTS permitted after the effective date of this Policy.

Nonstandard OWTS means a type of OWTS that utilizes a method of wastewater treatment that may or may not include a conventional septic tank and/or method of wastewater dispersal other than a conventional drainfield for the purpose of producing an equal to or greater quality wastewater effluent and improved performance of and siting for effluent dispersal than a standard OWTS. There are two types of non-standard systems. See Alternative OWTS and Experimental OWTS.

Occupancy is the classification of a structure as defined in the California Building Code (CBC), which is given based on the intended use and/or designed use of such structure. See CBC Chapter 3.

Office Clearance is a review of PRMD files and application documents in the office to determine that the proposed work will not impact the existing OWTS.

Operating Permit is a renewable and revocable permit to operate and maintain non-

standard experimental or alternative OWTS in compliance with specific operational or performance criteria stipulated by PRMD or the regulatory authority.

Onsite wastewater treatment system(s) (OWTS) means individual dispersal systems, community collection and dispersal system, and alternative collection and dispersal systems that use subsurface dispersal. The short form of the term may be singular or plural. OWTS do not include "graywater" systems pursuant to the Health and Safety Code Section 17922.12.

Package Treatment Plant is a method of sewage treatment that includes flows greater than 1500 gpd; wastewater used for Title 22 purposes and does not include process wastewater from agricultural sources etc, unless there is a domestic component. A package treatment plant uses a process involving energy and mechanical, biological, chemical or physical treatment of the wastewater to reduce the Biological Oxygen Demand (BOD), suspended solids, Nitrogen, bacteria and other sewage constituents and which is of a degree of complexity that a certified wastewater treatment plant operator or approved OWTS Service Provider is required.

Percolation Test is a test conducted to determine the permeability or percolation quality of the soil in an area proposed for sewage dispersal.

Perennial Stream is any stretch of a stream that can be expected to flow continuously or seasonally (Intermittent). Perennial streams are generally fed in part by springs and appear on USGS maps as a solid blue line. A perennial stream may include an intermittent stream which is a USGS designated blue line dashed stream that ceases to flow occasionally or seasonally because of evaporation and leakage.

Performance Wells are installed in and around an OWTS to monitor the performance of the system. Performance wells are a component of the OWTS with the design and construction meeting County standards.

Permitting Authority is the state or local unit of government with the statutory or delegated authority to issue permits to build and operate OWTS.

Pressure Dosing is the uniform application of wastewater under pressure is pressure dosing. Wastewater is applied under pressure uniformly on an intermittent basis in the dispersal field through the use of a sump and pump.

Pretreatment is a National Sanitation Foundation (NSF) 40 and/or NSF 245 (listed/certified) and County approved Advanced Treatment Unit that provides pretreatment of wastewater to reduce 5 day biochemical oxygen demand, total suspended solids, nitrogen, and/or the total and fecal coliform content to improve the wastewater quality prior to dispersal.

Public Water System is a water system regulated by the California Department of Public Health or a Local Primacy Agency pursuant to Chapter 2, Part 4, California Safe Drinking Water Act, Section 116275 (h) of the California Health and Safety Code.

Public Water Well is a ground water well serving a public water system. A spring which not subject to the California Surface Water Treatment Rule (SWTR), CCR, Title 22, Section 64650through 64666 is a public well.

Purge Valves are used in OWTS utilizing pressurized wastewater distribution to aid in the cleaning of laterals. Purge valves are generally placed at the end of each lateral.

Qualified Consultant is a California Registered Civil Engineer (RCE) or a California Registered Environmental Health Specialist (REHS). Qualified Consultant also includes a registered soil scientist or a registered geologist but are limited to soil investigations or soil evaluations. A qualified consultant must have demonstrated experience in the design of on-site sewage dispersal systems.

Redoximorphic means exhibiting characteristic features (soil mottles or soil mottling) caused by alternating reduction and oxidation of iron and manganese compounds.

Regulatory Authority. See Permitting Authority.

Remodel is the removal and/or replacement of 50% or less of the structure is cumulative from the effective date of the 2009 Policy and Procedure 9-2-13 Guidelines for Remodeling and Additions with Respect to On-Site Wastewater Treatment Systems.

Removal and/or Replacement shall consist of the removal, alteration and/or replacement of exterior structural vertical load bearing members and/or the addition of engineered components to exterior vertical load bearing members (shear walls, holdowns, and/or other engineered or prescriptive lateral bracing). Windows or doors cut or in-filled in existing walls shall be considered removed and/or replaced for the portion of wall altered. Walls removed to accommodate additions shall be considered removed and replaced. Walls separating garages and dwellings are included in this definition. Exterior garage walls are excluded from this definition.

Replacement OWTS means an OWTS that has its treatment capacity expanded, or its dispersal system replaced or added onto, after the effective date of this Policy.

Reserve Replacement Area is an unencumbered portion of land that is reserved for the installation of a future OWTS, in the event of primary OWTS failure. The reserve replacement area must be suitable for an OWTS as demonstrated with acceptable percolation testing, groundwater conditions, and adequate depth to soil. Reserve Replacement area is sometimes referred to as expansion area.

Residential is any structure or room labeled “R-” occupancy as defined by the California Building Code.

Rough-in means to install the preliminary (rough) plumbing, electrical and/or mechanical building materials without making the final connections. (Section 6: OWTS Requirements for Approval of Building Permits)

Sand is individual rock or mineral fragments in soils having diameters ranging from 0.05 to 2.0 millimeters. Most sand grains consist of quartz, but they may be of any mineral composition. It is classified in the USDA Soils Classification Triangle as a soil material that contains 85 percent or more sand and not more than 10 percent clay.

Saturated Soil is the condition of soil when all available pore space is occupied by water and the soil is unable to accept additional moisture. In very fine textured soils a free water surface may not be apparent. The extent of saturated soil conditions and anticipated level of high groundwater can be estimated by the extent of soil mottling, provided the soils contain the necessary iron compounds to exhibit mottling.

Seepage Pit is a pit filled with drain rock into which effluent from a septic tank is collected for gradual seepage into the ground. Seepage pits are typically substituted for a leachfield at severely constrained sites serving existing dwellings.

Septic Tank is a water tight, covered receptacle designed and constructed to receive the discharge of sewage from a building sewer; separate solids from the liquid; digest organic matter; store digested solids through a period of detention and allow the clarified liquids to discharge for final subsurface dispersal.

Service Provider means a Registered Civil Engineer, Registered Environmental Health Specialist, or any person who is licensed as a "certified on-site wastewater system inspector" or other equivalent license by passing a state or nationally accredited onsite wastewater exam, capable of operating, monitoring and maintaining an OWTS (e.g. NAWT and/or a proprietary unit certification).

Setback is the minimum horizontal distance from any point along the outside edge of a septic tank or the edge of a dispersal area, to any point on the described site feature.

Simple System is a graywater system serving a one or two family dwelling with a discharge of 250 gallons per day or less. Simple Systems exceed a Clothes Washer Graywater System.

Silt is individual mineral particles in a soil that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). It is classified in the USDA Soils Classification Triangle as a soil material that contains 80 percent or more silt and less than 12 percent clay.

Site Evaluation means soil profile evaluation, percolation test or ground water table determination, either individually or collectively.

Soil consists of the natural organic and inorganic material near the earth’s surface which is in contrast to the underlying rock material, has been formed over time by the interactions between climate, relief, parent materials, and living organisms.

Soil Depth is the combined thickness of adjacent soil layers which are suitable for effluent filtration. Soil depth is measured vertically to bedrock, hardpan, or an impermeable soil layer.

Soil Horizon or Layer is a layer of a soil approximately parallel to the land surface and differing from adjacent (underlying or overlying) layers in some property or characteristic. Differences include, but are not limited to color, texture, structure and porosity. Soil horizon is also known as soil zone.

Soil Profile is a vertical section of an excavation that displays the soil horizons.

Soil Structure refers to the formation of larger soil particles by the cementing together of individual sand, silt, and clay particles. Soil structure affects the pore size and rate at which water will move through soil. The structure of soil is generally described in the following terms granular, platy, blocky, prismatic, massive or columnar.

Soil Survey is a general term for the systematic examination of soils in the field and in the laboratory. This would include the soil description and classification, the mapping of kinds of soil, and the interpretation of soils for many uses such as suitability for growing various crops, grasses, and trees, for engineering uses, and predicting the soil behavior under different management systems.

Soil Texture is the relative proportions of sand, silt, and clay as defined by the classes of the U.S. Department of Agriculture soil textural triangle. Textural classes may be modified when coarse fragments are present in sufficient number or when the bulk density is excessive.

Standard OWTS is a type of OWTS consisting of a septic tank for primary treatment of sewage, followed by a system of drainfield trenches for subsurface dispersal of effluent into the soil. A standard OWTS may utilize gravity flow or a pump system to convey effluent from the septic tank to the drainfield.

Structure is that which is built or constructed.

Sump is a tank that collects treated sewage for a period of time and then, periodically, discharges by means of a pump.

Supplemental Treatment. See Pretreatment.

Tier 0 OWTS means existing OWTS that are properly functioning and do not meet the conditions of failing systems or otherwise require corrective action (for example, to prevent groundwater impairment) as specifically described in Tier 4, and are not determined to be contributing to an impairment of surface waters as specifically described in Tier 3.

Tier 1 OWTS means a new or replacement OWTS that meets low risk siting and design requirements as specified in Tier 1, where there is not an approved Local Agency Management Program per Tier 2. Tier 1 is not applicable to this LAMP.

Tier 2 OWTS means local agency OWTS management program that establishes minimum standards that are differing from requirements from those specified in Tier 1, including the areas that do not meet those minimum standards but still achieve the OWTS Policy purpose.

Tier 3 OWTS means existing, new and replacement OWTS that are within 600 feet of impaired water bodies that are subject to a TMDL or an Advance Protection Management Program that is part of a LAMP approved by the RWQCB.

Tier 4 OWTS means OWTS that require corrective action or are either presently failing or fail at any time while the OWTS Policy is in effect are automatically included in Tier 4. OWTS included in Tier 4 shall continue to meet applicable requirements of Tier 2 or 3 pending completion of corrective action.

Topographic Map is a map showing the topographic features of a land surface, commonly by means of contour lines. It is generally on a sufficiently large scale to show in detail selected man- made and natural features, including relief and physical and cultural features such as vegetation, roads, and drainage.

Unfinished structure is any structure, or any part of a structure, with exposed studs, and no insulation or sheet rock covering the walls. Unfinished rooms in a primary dwelling and/or residential accessory structure shall have exterior access doors only with no direct access to the interior of a primary dwelling and/or residential accessory structure. (Section 6: OWTS Requirements for Approval of Building Permits)

Unstable Landform is an area, which shows evidence of mass downslope movement such as debris flow, landslides, rockfalls, and hummocky hill slopes with undrained depressions upslope. Unstable landforms may exhibit slip surfaces roughly parallel to the hillside; landslide scars and curving debris ridges; fences, trees, and telephone poles which appear tilted; or tree trunks which bend uniformly as they enter the ground.

Watercourse is a definite open channel with bed and banks within which water flows either perennially or intermittently, including overflow channels contiguous to the main channel. A watercourse shall include both natural and man-made channels.

Section 4 Criteria for All OWTS

4.1 Purpose of OWTS

A. New and replacement OWTS shall be located, designed, constructed, and operated in a manner to ensure that sewage effluent does not surface at any time, that is protective of public health, safety and the environment and that percolation of effluent into the soil will not adversely affect beneficial uses of the waters of the state of California.

B. New and replacement OWTS and the repair of an OWTS shall comply with the requirements of this OWTS Manual.

4.2 Prohibitions

A. OWTS shared in common with other property owners are prohibited except with RWQCB and County authorization [e.g. on-site management district or zone or septic tank effluent pumping (STEP) cluster OWTS].

B. The use of holding tanks is prohibited. However, the use of holding tanks may be authorized for limited circumstances as follows:

   1. to abate an existing nuisance or health hazard; or

   2. the proposed use is within a sewer service area, sewers are under construction and completion is expected within two years and the sewering agency assumes responsibility for maintenance of the tanks; or

   3. it is for use at a campground or similar temporary public facility where a permanent sewage dispersal system is not necessary or feasible and maintenance is performed by a public agency; or

   4. Public service entity (e.g. volunteer fire department) when it cannot otherwise install sanitary facilities in a building.

C. The following are not authorized:

   1. Cesspools of any kind or size.

   2. OWTS receiving a projected flow over 10,000 gallons per day.

   3. OWTS that utilize any form of effluent disposal that discharges on or above the post installation ground surface such as sprinklers, exposed drip lines, free-surface wetlands, or a pond.

4. OWTS on slopes greater than 30 percent without a slope stability report approved by a registered professional.

5. Decreased leaching area for dispersal systems using a multiplier less than 0.70.

6. OWTS utilizing supplemental treatment without requirements for periodic monitoring or inspections.

7. OWTS dedicated to receiving significant amounts of wastes dumped from RV holding tanks.

8. Separation of the bottom of dispersal system to groundwater less than two (2) feet

9. Separation of the bottom of a seepage pit to groundwater less than ten (10) feet.

10. Installation of new or replacement OWTS where public sewer is available. Section 2.0 has additional details on this topic.

11. Public Water Wells. New or replacement OWTS with horizontal setbacks less than any of the following:

    a. 150 feet from a public water well where the depth of the effluent dispersal system does not exceed 10 feet in depth.

    b. 200 feet from a public water well where the depth of the effluent dispersal system exceeds 10 feet in depth.

    c. Where the effluent dispersal system is within 600 feet of a public water well and exceeds 20 feet in depth the horizontal setback required to achieve a two-year travel time for microbiological contaminants shall be evaluated. A qualified professional shall conduct this evaluation. However in no case shall the setback be less than 200 feet.

Table 4.1 – Minimum Horizontal Setbacks from Public Water Wells

Depth of Dispersal System	Horizontal Setback
Less than or equal to 10 feet	150 feet
Greater than 10 feet	200 feet
Greater than 20 feet	200 foot minimum 2 year travel time within 600 feet

12. Public Water Systems. New or replacement OWTS with minimum horizontal setbacks less than any of the following:

    a. Where the effluent dispersal system is within 1,200 feet from a public water systems' surface water intake point, within the catchment of the drainage, and

located such that it may impact water quality at the intake point such as upstream of the intake point for flowing water bodies, the dispersal system shall be no less than 400 feet from the high water mark of the reservoir, lake or flowing water body.

b. Where the effluent dispersal system is located more than 1,200 feet but less than 2,500 feet from a public water systems' surface water intake point, within the catchment area of the drainage, and located such that it may impact water quality at the intake point such as upstream of the intake point for flowing water bodies, the dispersal system shall be no less than 200 feet from the high water mark of the reservoir, lake or flowing water body.

Table 4.2 – Minimum Horizontal Setbacks from Public Water Systems

Distance From Public Water Intake	Dispersal System Standard
Less than 1200 feet	Greater than or equal to 400 feet water source[1]
Equal to or greater than 1200 feet and less than 2500 feet	Greater than or equal to 200 feet water source[1]
1: water source is the high water mark of the reservoir, lake or flowing water body.	

4.3 Mitigations to Prohibitions

A. To mitigate prohibition 4.2.C.4 (slopes over 30%), a slope stability report, completed by a registered civil engineer or registered geotechnical engineer, may be submitted to justify OWTS on slopes over 30%. The slope stability report shall be reviewed and approved by PRMD.

B. To mitigate prohibition 4.2.C.6 (periodic monitoring), OWTS utilizing supplemental treatment components shall be enrolled in our Operational Permit Program, which requires monitoring and maintenance of the system.

C. To mitigate prohibition 4.2.C.8 and 4.2.C.9 (vertical separation to groundwater), the owner shall file a Notice of Intent with the appropriate Regional Water Board for waste discharge requirements, waiver of waste discharge requirements or a conditional waiver of waste discharge requirements.

D. To mitigate prohibition 4.2.C.11 and 4.2.C.12 (horizontal distances from water sources):

a. Replacement OWTS shall utilize supplemental treatment and other mitigation measures to meet the treatment standards in Table 4.3, unless the permitting authority finds that there is no indication that the previous system is adversely affecting the public water source, and there is limited potential that the

replacement system could impact the water source based on topography, soil depth, soil texture, and groundwater separation.

b. New OWTS shall meet the horizontal separation to the greatest extent practicable and shall utilize supplemental treatment to achieve the Table 4.3 standards and any other mitigation measures prescribed by the permitting authority.

Table 4.3 – Treatment Standards for New OWTS not in conformance with horizontal separation requirements

Constituent	Standard
Total Suspended Solids	30 mg/L as 30 day average
Fecal Coliform	200 Most Probable Number (MPN)
Soil Depth	Greater than 3 feet
Depth to Groundwater	Greater than 3 feet
Soil Cover over dispersal system	12 inches

4.4 OWTS Designer by System Type

A. The type of OWTS or OWTS components listed in Table 4.4 shall be designed by the corresponding designer.

1. A commercial/institutional, experimental, alternative, or a standard OWTS shall be designed by a qualified consultant.

2. A replacement dispersal area or field shall be designed by a qualified consultant.

3. A replacement septic tank may be designed by a qualified consultant or licensed contractor.

4. A repair may be designed by a qualified consultant, licensed contractor or land owner.

5. A repair or modification of an existing OWTS that was originally required to be designed by a Qualified Consultant shall be designed by a Qualified Consultant.

6. Any parcel that was conditioned through the Project Review Advisory Committee or comparable land use body to have the OWTS designed by a Qualified Consultant that serves a parcel for which a Qualified Consultant-design was a condition of a subdivision shall be designed by a Qualified Consultant.

Table 4.4 – OWTS Designer by System Type

Type of System		Designer
Commercial/Institutional Experimental OWTS Alternative OWTS Standard OWTS Replacement Dispersal Area/Field OWTS with Easements		Qualified Consultant
Replacement Septic Tank		Qualified Consultant Licensed contractor (A, C-42, C-36)
Repair		Qualified Consultant Licensed contractor (A, C-42, C-36) homeowner/builder

4.5 Sizing Criteria Wastewater Flows

A. Residential wastewater flows used for design of OWTS for single family residences, second units, guest houses and other detached buildings, shall be based on the number of bedrooms multiplied by a factor of 150 gal/day per bedroom, for the first five (5) bedrooms, plus 75 gal/day for each additional bedroom, as indicated in Table 4.5.a.

B. The design flows for a primary residence and detached accessory structures (second unit and/or guest house) shall be determined independently, regardless of whether the flows are treated separately or combined in a single OWTS.

Table 4.5 -- Wastewater Design Flows for Single Family Residences and Second Unit

Number of Bedrooms	Design Flow (gal/day)
1	150
2	300
3	450
4	600
5	750
> 5	+75 per bedroom

C. Wastewater flows used for the design of OWTS for multiunit residences and non-residential projects shall be developed based on full consideration of projected activities, occupancy, and facilities. Table 11.1 provides guidelines for use in estimating design wastewater flows. Wastewater flows shall be determined by:

1. Table 11.1 for those listed facilities; or

2. appropriate literature references (e.g. US/EPA) for the type of facility proposed; or

3. Documented wastewater flow monitoring data for a comparable facility. Additionally, the director of PRMD may consider adjustment to the criteria listed in Table 11.1 for specific facilities based upon documented technical information to support the proposed design flow estimate.

D. Reductions of wastewater design flows up to 20% shall be approved by the Permit Authority when each of the following is provided:

1. Low flow devices for toilets, showers and faucets are installed in the structure under permit.

2. The septic tank shall be fitted with a corrosion-resistant effluent filter approved by the Permit Authority.

3. The leach field shall be either:

   a. a dual leach field with each half designed at 75% of the reduced design flow (either 50% or 150% additional reserve replacement area must be provided based upon the date the lot was created); or

   b. a dispersal field using equal distribution. The dispersal field shall be sized based upon 100% of the reduced flow.

4.6 Off-Site Easements

A. Methods to gain legal access to adjacent parcels to accommodate an OWTS include:

1. a lot line adjustment,
2. a parcel merger, or
3. a legal easement.

B. Easements shall be recorded with the County Recorder's office in a form acceptable to County Counsel and the PRMD and shall include:

1. A Grant Deed conveying the easement from the record owners of the burdened parcel to the owners of the parcel to be developed.

2. A full legal description of the easement area prepared by a Licensed Land Surveyor or a Registered Civil Engineer whose registration allows surveying.

3. All appurtenant easements for access, pipelines, drainage, etc., shall be conveyed in the grant deed.

4. Conditions, Covenants, and Restrictions recorded on the deed as follows:

    a. A statement that the easement shall bind and inure to the benefit of the respective heirs, personal representatives, successors, and assigns of the grantor and grantee and that all specifications of the easement shall pertain to and run with the land.
    b. A statement that provision of the easement is a public health condition relative to approval of an OWTS permit and that alteration or elimination of the rights and duties without the express written consent of the County of Sonoma may constitute a violation of State and local laws.
    c. The use of the area of the leach field easement by the grantor shall be restricted from uses which are incompatible with proper leach field operation. This shall include structures, vehicular parking, roadways, grading, drainage courses, wells, extensive landscaping, confined livestock or other uses which would disrupt the leach field.
    d. The easement shall include the right of the grantee to do all things reasonably necessary to inspect, maintain, repair and/or replace the leach field.

5. The grant deed and/or legal description referenced in Section 4.6.B.1 and 4.6.B.2 shall be reviewed by the County Surveyor's office prior to permit issuance.

C. Leach field easements shall be separate and distinct from one another.

D. An OWTS easement shall not encroach into an area needed for the grantor parcel's OWTS and/or reserve expansion area.

1. The area necessary for the grantor parcel's OWTS and its reserve expansion area shall be based upon codes in effect at the time of the grantee parcel's OWTS easement application.

2. The grantor parcel's OWTS does not need to be modified unless it is in a state of failure.

E. Refer to Section 15 for OWTS easement requirements for new subdivisions of property.

F. An easement grant from one property owner to another shall comply with the following:

1. The grantor parcel and grantee parcel must abut each other.

2. An unimproved lot will be considered as “abutting” if it is connected to another lot by an easement provided that the lots are in common ownership. (Sonoma County Code, Chapter 7).

3. An “abutting lot” is also an improved lot connected to another lot by an easement. The lots need not be under common ownership so long as the lot owner has an easement over the abutting lot sufficient for an OWTS.

4. Lots separated by a public road or highway shall not be considered abutting except as provided in (F) above. A public road or highway will satisfy the connection between abutting lots.

    a. An encroachment permit must be obtained from this department.

G. An easement grant when lots are in common ownership comply with the following:

1. A deed of easement from the owner of each parcel burdened by the easement to the owner of the parcel upon which the building will be located,

    a. Locating the easement upon that parcel;
    b. Stating that the easement is a condition of County approval of the OWTS;
    c. Stating that it is the intent of the grantor and grantee that the easement will not merge with the underlying fee interest even if the easement and the fee come into the same ownership, and that the easement is intended to survive severance of the estates and to be included in conveyances to subsequent purchasers;
    d. Stating that the easement may not be quitclaimed or otherwise modified or destroyed without the written consent of the Director of the PRMD, which shall not be unreasonably withheld;
    e. Stating that the easement is appurtenant to the lot upon which the building is to be constructed.

2. A Declaration of Covenants, Conditions and Restrictions upon each affected parcel which states that:

    a. the benefits and burdens of the covenants and restrictions shall be binding upon the successive owners of each parcel;
    b. the burdened parcels (described) shall not be used in any manner which may interfere with or adversely affect the safe operation of the OWTS for the structure of lot (__);
    c. the OWTS shall be located in the area described in the easement for sewage dispersal executed by___ on (date) ___ and recorded as Document No. ___ of Official Records of Sonoma County, and which is incorporated by reference (or similar language);
    d. the covenants contained in the declaration may be terminated or modified only with the written consent of the Director of the PRMD, which shall not be unreasonably withheld. This provision would be applicable when and if the

Department of PRMD approves some other type of sewage dispersal, and the easements and restrictive covenants are no longer needed.

3. The affected lots shall be conveyed to a title company or some other "straw man" by a deed which incorporates the easements and the declaration of covenants, and then reconveyed back to the owner.

    a. The property owner shall supply the PRMD with a letter indicating his intentions to include the easements and covenants in future deeds of the affected parcels.

4. Another option is the use of a properly constructed "Owner Statement" that provides the following minimum specific items:

    a. Language that prohibits the "removal, alteration or rescinding of the Declaration of Restriction(__) or easement(s) without the written consent of the Director of the PRMD.
    b. For "Declarations of Restrictions" only, reference must be made within the Owner's Statement to a "Declaration of Restrictions" that must be recorded concurrently with the Map.
    c. Where easements are requested with the existing parcels, the Owner's Statement must also include the following:

        i. A reference that specifies that the easement is "between adjacent parcels of the same ownership" and that attached hereto as Exhibit ___ is a Grant Deed description of an easement.
        ii. A reference in both the Owner's Statement and the easement that the "easement is one that is appurtenant."
        iii. A reference on both the Owner's Statement and the easement that the "doctrine of merger shall not apply."

4.7 OWTS Permit Applications

A. An application for an OWTS permit (Appendix A) shall be submitted by the property owner, consultant, or contractor. The application package shall contain the following:

1. Project description.

2. Variance requests: code section(s) and mitigation measure(s).

3. Filing fees.

4. Four copies of site plans, drawn to scale.

5. Soil profile results.

6. Soil percolation test results if required per section 7.

7. Groundwater table determination if required per section 7.

8. Four copies of the OWTS design, drawn to a scale of 1 inch = 20 feet.

9. If a nonstandard OWTS, include:

    a. Operational Permit application
    b. Agreement-Permit Conditions, signed and notarized
    c. Easement Agreement signed and notarized
    d. These three items are not required for a plan check only applications, but will be required for permit applications.

B. Time Limit of Application. If no permit is issued within one year following the date of application, the application shall expire by limitation, and plans and other data submitted for review may thereafter be returned to the applicant or destroyed by the Permit Authority. If, after such expiration, the original plans are resubmitted within 180 days following such expiration, the plan review fee shall be 25% of that otherwise required. No application shall be renewed in this fashion more than once. In order to further renew action on an application after expiration, the applicant shall resubmit plans and pay a new plan review fee. The Permit Authority may extend this time period when such extension is warranted, including but not limited to:

    1. to correct an error by the department;

    2. when a legal action prevents the project from being completed within the allowed year time frame; or

    3. in the interest of public health and safety

    The Permit Authority's decision regarding the limitation period shall be final.

C. OWTS applications shall be reviewed for zoning conformance pursuant to Permit Authority's Planning Policy 8-1-13, or current version.

4.8 OWTS Plan Check Only Applications

A. An application for an OWTS Plan Check Only shall be submitted by the property owner, consultant, or contractor. The application package shall contain the following:

    1. A "Request for Service" form.

    2. Filing fees.

    3. Two copies of site plans, drawn to scale.

    4. Soil profile results.

5. Soil percolation test results if required per section 7.

6. Groundwater table determination if required per section 7.

7. Two copies of the OWTS design, drawn to a minimum scale of 1 inch = 20 feet.

B. Time Limit of Plan Check Only Application. If no plan check approval is granted within one year following the date of application, the application shall expire by limitation, and plans and other data submitted for review may thereafter be returned to the applicant or destroyed by the Permit Authority. If, after such expiration, the original plans are resubmitted within 180 days following such expiration, the plan review fee shall be 25% of that otherwise required. No application shall be renewed in this fashion more than once. In order to further renew action on an application after expiration, the applicant shall resubmit plans and pay a new plan review fee. The Permit Authority may extend this time period when such extension is warranted, including but not limited to:

1. to correct an error by the department;

2. when a legal action prevents the project from being completed within the allowed year time frame; or

3. In the interest of public health and safety.

The Permit Authority's decision regarding the time limit period shall be final.

C. Time Limit of Plan Check Only Approval. If no permit is applied for within one year following the date of plan check only approval, the plan check only shall expire by limitation.

4.9 OWTS Permits Required

A. A valid permit is required to install, repair, replace, modify, destroy, or abandon any part of a new or existing OWTS except where specified in section 4.9.F.

1. The Permit Authority may approve, conditionally approve or deny a permit to do any work on an OWTS. The Permit Authority may issue a permit only when all the requirements specified in this chapter for an OWTS are met. The permit may contain conditions that apply to the construction, operation and maintenance of the system. Only OWTS work authorized in the approved plans may be performed unless approved in writing by the Permit Authority. The permit conditions shall be binding upon the property owner and successive property owners for the life of the system.

B. OWTS Permit. The following work requires an OWTS permit:

1. The installation, replacement, modification, destruction or abandonment of any part of a new or existing OWTS not authorized by a repair or replacement permit.

C. Replacement Permit. The following work requires a replacement permit:

1. Replacement or repair of a septic tank.

2. Replacement of a dispersal system.

D. Repair Permit. The following work requires a repair permit:

1. The replacement or repair of a leach line or leach line segment within an existing leach line trench.

2. The replacement or repair of a dispersal chamber or chamber segment within an existing chamber trench.

E. Hardship Replacement Permit. Applicants may apply for a hardship replacement permit under the following circumstances:

1. Work would otherwise be considered a replacement permit.

2. Financial constraints prevent compliance with replacement standards.

3. A County Housing Rehabilitating Loan is not available.

4. The landowner's household income is at or below 80% of the current Area Median Income (AMI) established by the U.S. Department of Housing and Urban Development.

5. A hardship replacement permit application shall be submitted to the Permit Authority. Applications shall contain the contents as detailed in section 4.8.

6. Replacement septic tanks shall comply with the septic tank requirements of this OWTS Manual to the maximum extent feasible.

7. Replacement dispersal systems shall comply with this OWTS Manual to the maximum extent feasible.

8. Hardship replacement permits shall be forwarded to the appropriate Regional Water Board.

9. Hardship replacement permits shall not be used to authorize building permits for the construction, re-construction, rebuilds, remodel, or work on a structure that would otherwise require an upgraded septic system.

F. Permit Exemptions. The following work is permit exempt:

1. The repair or replacement of the following components or segments:
   a. risers
   b. sanitary tees
   c. effluent filters
   d. diversion valves
   e. distribution box
   f. sewer line from house to septic tank
   g. sewer line from tank to distribution box and/or distribution box
   h. solid sewer lines connecting distribution boxes and/or distribution box(es)

G. Time Limitation of Issued Permit. Every permit issued by the Permit Authority under the provisions of this section shall expire by limitation three (3) years from the date of permit issuance. The Permit Authority may limit a permit to a lesser time period when necessary to abate dangerous or substandard conditions. The Permit Authority may extend this time period when such extension is warranted, including but not limited to:

   1. to correct an error by the department,

   2. when a legal action prevents the project from being completed within the three year time frame, or

   3. in the interest of public health and safety.

   The Permit Authority's decision regarding the time limit period shall be final.

H. Before any work can be commence or recommence on any expired permit, or permit to legalize a violation, a new permit shall first be obtained. The new permit shall be obtained for all work necessary to finish the project including work already completed that has not been previously inspected and approved by the department.

   1. Any new permits issued to recommence work started under an expired permit will be based on the codes in effect at the time of the original expired permit was issued.

   2. Any new permits issued to commence work under an expired permit will be based on the codes in effect at the time of the original expired permit, provided that no more than six years from date of original permit issuance have lapsed.

   3. Any new permits issued to commence work under an expired permit where more than six years from date of original permit issuance shall be governed by the codes in force at the time of the new permit application.

   4. Any new permits issued to legalize a violation shall be governed by the codes in force at the time of the new permit application.

4.10 OWTS Site and Design Plan Requirements

A. The site plan shall be completely dimensioned and drawn to scale with a minimum of 1 inch = 20 feet. The site plan shall include but not be limited to the following:

1. A vicinity map showing property boundaries and dimensions with north arrow, parcel number, street address. (May be drawn on a smaller scale than 1 inch = 20 feet)

2. A site plan with topographic information including contour lines and elevations (in feet) of the area in and around the proposed OWTS or percentage of slope when slope is not a critical factor in system design.

3. Location of any known pertinent (passing or failing) tests (i.e. soil profile pits, soil percolation tests, and groundwater determination tests, etc.)

4. Designated reserve replacement dispersal area.

5. Detail Page showing:

    a. Application rate, design capacity (number of bedrooms), projected daily sewage flow, wastewater application area (trench, bed length, or area), and all relevant calculations.
    b. Calculations for determining the sizing criteria, and the projected design of the OWTS, including pump sizing, pump curves, dose volume and frequency.
    c. Cross section of dispersal trenches and interceptor drain (if applicable).
    d. Spacing and sizing of the orifices and laterals.
    e. Proposed details and dimensions of the septic tank, treatment units, pump tanks, performance wells, valves, dispersal trenches or beds, alarm and control panels, and any other equipment specifications.
    f. Complete description of the wastewater treatment and dispersal processes.
    g. Construction notes.
    h. Construction details and specifications.

6. Location of any existing and/or proposed retaining walls, surface and subsurface drainage systems.

7. Location of any existing and/or proposed underground utilities, water supply lines and/or wells.

8. Location and dimensions of any existing and/or proposed improvements (e.g. paved areas, all structures (including house location, accessory structures, outbuildings, swimming pools, large trees, solar arrays, etc.)

9. Location of any existing and/or proposed easements, public right of ways, overhead utilities, building sewer line, and any other OWTS.

10. Location of the OWTS in relation to property lines, neighboring systems, neighboring wells, streams, springs, lakes, ponds, marsh areas, cut banks, and other features which may affect the performance of the system.

11. Any other site details that could potentially impact the function and/or design of the OWTS.

4.11 Permit Transfer

A. In the event of the transfer of an issued OWTS permit, prior to final construction approval, the following actions are required

   1. If there is no change in the OWTS plans or building plans, it will be treated as an OWTS Office Clearance to use the old plans

      a. Verify that contractor information, worker's comp and signatures are correct
      b. Update Easements and Supplemental Agreement for nonstandard OWTS
      c. Enter into Accela and charge Office Clearance fee.

   2. If there is a change in building location, but no change in the OWTS plans and the change may affect the OWTS plan

      a. Complete items 4.11.A.1.a and 4.11.A.1.b.
      b. Enter into Accela and charge Field Clearance fee.

   3. If the OWTS design and building location remain the same, but there is a change in floor plans (which does not impact the OWTS)

      a. Review new building floor plan and complete items 4.11.A.1.

   4. If there are changes which significantly impact the approved OWTS plan:

      a. Complete items 4.11.A.1.a and 4.11.A.1.b.
      b. Applicant required to submit new OWTS plans. Collect plan review fee.

   5. If the property requires a Service provider, the same Service provider shall be retained or a contract needs to be transferred to a new certified Service Provider.

4.12 Construction Inspections

A. The system components and construction shall be inspected by Permit Authority staff for compliance with approved plans and this OWTS Manual. The following construction inspections are required and shall be scheduled with the Permit Authority. Permit Authority may waive attendance.

1. Pre-construction site inspection.

2. Gravel placement, trenches or absorption bed should be level in previously approved proper location and placed on contour.

3. Interim inspections, including squirt test, performed prior to covering any elements of the system, water tightness test of tank(s), if required.

4. Final inspection of the completed system (may require #189 electrical permit prior to final. Startup inspection for pretreatment unit includes Service Provider).

B. Construction inspections shall be scheduled for regular Permit Authority work day. The Permit Authority must be notified at least 24 hours in advance of desired inspection. No portion of the OWTS may be covered until it is inspected by the Permit Authority.

C. Final approval of the OWTS permit shall be granted only after the ~~Department Staff~~ Permit Authority has completed all necessary system inspections. Final approval of the permit for standard OWTS shall be granted only upon completion of the necessary inspections, the ~~and~~ receipt of a signed and stamped letter from the Qualified Consultant certifying the installation of the system as designed, and for non-standard systems, in addition to the above, the #189 electrical inspection and Operational Permit fee paid and activated.

4.13 General Provisions

A. Replacement Expansion Area

1. Parcels created prior to October 1971 require 100% replacement area.

2. Parcels created in October 1971 or later require 200% replacement area.

3. In a dual dispersal field system, a portion of the replacement area is constructed with the initial system.

B. Incompatible uses including, but not limited to, driveways, tennis courts, parking lots, swimming pools, or structures over the replacement area shall be prohibited.

C. No lot shall be improved in excess of its capability to properly absorb sewage effluent.

D. No construction of OWTS shall occur during open wet weather groundwater periods or active rain storms, except when demonstrated by a qualified consultant that unsaturated soil conditions exist and compaction and smearing will not occur. Previously scheduled inspections are subject to cancelation by the Permit Authority if conditions are deemed unsuitable.

E. OWTS shall be installed in accordance with the plans approved by the Permit Authority. The Permit Authority staff must approve any changes to the approved plans prior to installation.

F. OWTS shall be located so as to be accessible for maintenance and repairs. Septic tanks and sump tanks shall be located so as to allow vacuum pumping.

G. The building sewer and distribution piping shall be constructed with materials in conformance to building sewer standards identified in the Uniform Plumbing Code. The sewer and distribution piping shall have approved watertight fittings with clean-outs provided in accordance with the Uniform Plumbing Code.

H. All OWTS Permit applications, located near a water body that is subject to a TMDL Advanced Protection Management Program (APMP), may be subject to additional, more stringent, criteria than those systems located outside a designated APMP.

I. Site evaluations are required for new or replacement OWTS per Section 7.

J. Any structure not in use with the last five (5) years shall have an OWTS that meets current standards for a new OWTS system.

K. Human remains and archeological sites.

L. Any application that cannot meet the standards may apply for a variance pursuant to section 17.

M. A structural or building addition may not encumber any designated reserve replacement area. A revised designated reserve replacement area may be established if needed.

N. An expansion of the existing footprint of an existing structure or new accessory structure is not allowed if a reserve replacement system cannot be adequately sized. A system where only a seepage pit reserve replacement area is available is not considered to be adequately sized.

Section 5 OWTS Abatements and Abandonments

5.1 Abatements

A. Any OWTS that causes sewage to surface on the ground is deemed to have an adverse effect on groundwater and surface water and to be a public health hazard and a nuisance. Any OWTS septic tank failure, such as a baffle failure or tank structural integrity failure such that either wastewater is exfiltrating or groundwater is infiltrating is deemed to be failing (OWTS Policy Tier 4). Such a system is defined as a failing OWTS and shall be immediately corrected or abated.

B. There are two classes of septic work to which Code Enforcement penalty fees may apply: construction without permit or Permit Authority required repair of a failing septic system.

   Once the Permit Authority determines a system is failing, adequate notification to the property owner is required.

   1. A Notice of Violation or Notice and Order is adequate notification. However, a written notice or letter produced by the Permit Authority and provided to the property owner may be considered adequate notification as determined by the Permit Authority supervisory or management staff.

   2. A reasonable period shall be given to allow the property owner to obtain a repair permit and complete repair work. Enforcement staff shall treat failing septic systems in the same manner as sub-standard housing regarding the imposition of penalties.

      1. If a repair permit is submitted within 30 days of sending a Notice of Violation or Notice and Order, only investigation fees apply.

      2. If the owner delays response beyond 30 days, both investigation and penalties will apply.

         i. The imposition of penalties may be extended if the applicant can demonstrate a reasonable justification why a permit application could not be submitted within 30 days in accordance with Section 1-7.1 (d) Sonoma County Code. Reasonable justifications include, but are not limited, to ground water studies or delay to accommodate the schedule of a licensed professional.

C. For residential properties, the owner shall be allowed to hire a licensed septic tank pumper to pump the failing system until a repair system is installed.

   1. The allowed time period shall be determined by the Permit Authority.

D. For commercial properties, the property owner or tenant may be allowed to pump the failing system at the discretion of the Permit Authority. Issues such as the availability of public restrooms hand washing facilities, and use as a food facility must be taken into consideration for commercial properties.

E. Investigation and penalty fees for the abatement of failing OWTS and/or installation of an OWTS without permit that may apply are as follows:

1. For septic system replacement, repair or tank destruction permits where the property owner has voluntarily submitted a repair permit and no investigation has been conducted, the permit may be issued without investigation fee or penalty.

2. For septic system replacement, repair or tank destruction permits where a Notice of Violation has been sent and the owner has submitted a septic repair permit within 30 days, penalties shall not be imposed.

3. For septic system replacement, repair or tank destruction permits where PRMD has received a complaint, a Notice of Violation has been sent and the owner has not submitted for a permit within 30 days, penalties shall be calculated.

4. If the responsible party (owner or tenant) fails to correct the violation resulting in an administrative abatement hearing, any penalty as allowed under Section 1-7.1 of the Sonoma County Code may be imposed.

5. For standard or non-standard OWTS constructed without permit, penalties shall be calculated.

5.2 Abandonments

A. Any abandonment of portions or the entire OWTS shall be conducted under an OWTS permit issued by PRMD.

B. In the event that a parcel is connected to public sewer, abandonment of the septic tank(s) is required.

C. The following requirements shall be observed when a septic tank or sump (e.g. tank) is abandoned.

1. The tank shall be pumped of all contents by a licensed septic tank pumper.

2. When abandoned in place:

a. The lid(s) shall be removed and disposed at a sanitary landfill or the tank lid may be broken into small pieces and placed into the tank with the gravel, rock or soils.

b. Several holes shall be made in the bottom of the tank.

c. The tank shall be filled with pea gravel, drain rock, compacted native soils or concrete slurry. Provision b does not apply if tank if filled with concrete.

3. When tank is removed:

a. The tank and lid(s) shall be removed from the property and disposed at a sanitary landfill.

Section 6 OWTS B-BLD Clearance Requirements

Sonoma County Code Section 7-5(b)(2) requires well and septic clearance in relation to building structure improvement projects. The required OWTS is dependent upon the extent of the proposed structural improvement(s). Table 6 summarizes the requirements within this section.

Table 6 -- OWTS Requirements for Building Permits

Type of Structure Modification (Building Permit)	Code Compliant System	Legal Non-Conforming System	No Septic Review
A-BLD			X
B-BLDs: Reroof Foundation Repair ADA Improvements FEMA Flood Elevations Seismic Safety Interior Remodel Catastrophic Event Rebuild		 X[1] X[1] X[1] X[1] X[1] X[1] X[1]	
Minor Rebuild		X	
Minor Addition (<= 640 sq ft)		X	
Detached Accessory Structures (<640 sf, R, S or U occupancy)		X	
BDR swap (Primary/guest house)		X	
Commercial -- Decrease in Flow and Strength		X	
Detached Accessory Structure (No Plumbing)		X	
Major Rebuild	X		
Major Addition (> 640 sq ft)	X		

BDR swap (Primary/Accessory Dwelling Unit)	X		
Detached Accessory Structures >640 sf, R occupancy	X		
BDR Addition, Guest House or Accessory Dwelling Unit	X		
Commercial (Increase in Flow/ Strength)	X		
Reutilized Structure After Vacant For Five (5) Years	X		
Undeveloped Parcel	X		
Footnote 1:	Please see section 6.2.B.		

6.1 Building Permit / OWTS Clearance Procedure

A. Verifiable information on the location, construction, integrity and function of the existing system is required.

B. An Office Clearance for B-BLDs that are subject to the criteria for a Legal Non-Conforming OWTS Permit Standards shall be acceptable when there are file records that provide documentation that the proposed work does not affect the Legal Non-Conforming OWTS or potential reserve expansion area, the Legal Non-Conforming OWTS installation was finaled less than 20 years before the date of B-BLD application, and the Legal Non-Conforming OWTS is not subject to Code Enforcement action.

C. PRMD shall determine if a variance request is required for those existing OWTS that are required to meet the Code Compliant status.

D. Any B-BLD clearance involving a retail food facility must be approved by the Department of Health Services, Division of Environmental Health.

E. Additional requirements may apply to properties located within variance prohibition or septic system ban areas.

6.2 A-BLDs, Building Repairs and Maintenance

A. A-BLDs do not require Well & Septic Division clearances. If the scope of work is exceeded to the point that the work no longer qualifies as an A-BLD, a Well & Septic Division Clearance is required.

B. B-BLDs for foundation repair and re-roofing with limited framing replacement (see PRMD Policy 4-0-7, A-BLD Permits), disability accessibility improvements, FEMA flood elevations, and seismic safety improvements do require Well & Septic clearance, but are not considered a remodel or rebuild for purposes of triggering an OWTS upgrade, unless the structure is on a cesspool or the OWTS is in failure, in which case a Legal Non-Conforming OWTS is required.

6.3 Minor Rebuilds and Minor Additions

A. An existing legal non-conforming OWTS or a replacement OWTS is required for the following:

   1. A minor rebuild.

   2. A minor addition to the primary dwelling.

   3. A minor addition to a residential occupancy accessory structure such as pool houses, non-commercial offices, gyms, studios, etc.

   4. A minor addition to a guest house provided the new total square footage of the guest house does not exclude 640 square feet.

   5. A storage (S) occupancy or utility/miscellaneous (U) occupancy accessory structure.

   6. A primary dwelling/guest house bedroom swap. The approval of a bedroom swap requires a building permit to decommission the bedroom in the primary dwelling.

B. The building application shall document that the proposed work does not affect the OWTS or designated reserve replacement area.

C. The structure's OWTS shall not be subject to Code Enforcement action.

D. A Findings Report, pursuant to section 6.7, is required for those OWTS with final construction approval more than 20 years before the date of the B-BLD application.

6.4 Major Rebuilds, Major Additions and Bedroom Additions

A. A code compliant OWTS is required for the following:

1. An increase in wastewater flow.

2. An increase in the number of bedrooms.

3. A major addition to the primary dwelling.

4. A major addition to a residential occupancy accessory structure such as pool houses, non-commercial offices, gyms, studios, etc., but excluding guest houses.

5. A rebuild unrelated to a catastrophic event or natural disaster.

6. A primary dwelling/accessory dwelling unit bedroom swap. The approval of a bedroom swap requires a building permit to decommission the bedroom in the primary dwelling.

B. The structure's OWTS shall not be subject to Code Enforcement action.

C. The application shall demonstrate a reserve replacement area consistent with section 4.13.A.

E. A Findings Report, pursuant to section 6.7, is required for those OWTS with final construction approval more than 20 years before the date of the B-BLD application.

D. A Permit Authority site inspection shall be conducted.

E. A site evaluation, pursuant to section 7, shall be conducted if a soils evaluation has not already been completed.

F. Low flow fixtures shall be installed for all structures serviced by the OWTS.

G. A notarized document may be filed with the County Recorder. If required, the notarized document shall be signed by the property owner. The notarized document shall document any permit conditions and any use restrictions (i.e. bedroom restrictions).

6.5 Commercial Buildings and Changes in Use

A. The building application shall contain information regarding changes in use, changes in wastewater characteristics and/or changes to the structure.

B. When the Permit Authority finds there is a change in use, a change in wastewater characteristics and/or a change in the structure, the most stringent of following requirements shall apply:

1. A code compliant system shall be required for a change in use.

2. A code-compliant OWTS is required if there is an increase in the volume and/or strength of the commercial use wastewater generated.

3. A legal non-conforming OWTS is required if there is no change or a decrease in the volume and strength of the commercial use wastewater generated.

C. The criteria and requirements of sections 6.2, 6.3 and 6.4 for physical changes to the structure apply to commercial construction activities.

D. Any clearance involving a retail food facility shall be approved by the Department of Health Services, Division of Environmental Health.

6.6 Criteria for Minor versus Major Rebuilds and Minor versus Major Additions

A. Minor and major rebuilds are defined by the percentage of removal and/or replacement of the exterior vertical load bearing walls being proposed under a building permit. This section provides the details and process to establish the percentage of the removal and/or replacement of the structure.

1. Minor rebuilds shall include projects where the percentage of wall structure being removed and/or replaced is less than 50%.

2. Major rebuilds shall include projects where the percentage of wall structure being removed and/or replaced is equal to or greater than 50%.

B. The percent of wall structure being removed and/or replaced shall be the “affected wall length” divided by the “total wall length.”

C. The “affected wall length” will be determined by measuring the work listed in F.1 through F.6 and added together.

D. The “total wall length” will be determined by measuring the existing vertical load bearing wall lengths.

E. Removal and/or replacement of a structure involves the following elements of the structure:

1. Exterior walls of any structure, or

2. Interior tenant improvements for commercial structures.

F. Removal and/or replacement to a wall structure includes, but is not limited to, the following:

1. Work on supporting members of the wall including, but are not limited to, studs, top plates, bottom plates, headers, trimmers, and/or associated blocking.

2. Work on all or part of a member, furring of a member, cutting or drilling of studs or members for the installation of plumbing, electrical or mechanical systems beyond that allowed by the California Building Code.

3. Moving studs or members of a wall by jacking them up, storing them on site, or otherwise changing their position in space.

4. Cutting of openings for new windows or filling in existing window openings.

5. Exterior walls removed to accommodate additions.

6. For work related to whole walls or wall segments or work involving more than one adjacent stud or member, that work shall be grouped and added to the "affected wall length."

7. For work related to single studs or members, the altered length shall be three feet of wall length and added to the "affected wall length."

G. The following are NOT considered removal and/or replacement:

1. Additions or repairs to the foundation pony walls solely for the purpose of seismic retrofit.

2. Replacement or alteration of the interior or exterior wall coverings, plumbing systems, mechanical systems, or electrical systems, and drilling or cutting of members as allowed by the building code for the installation of plumbing, electrical or mechanical systems.

3. Foundation repair or replacement provided the foundation walls are not relocated.

H. Additions

1. Additions to existing structures shall have the square footage measured by the Permit Authority. The designation of the addition shall be as follows:

   a. Minor addition has a square footage of 640 square feet or less.
   b. Major addition has a square footage of greater than 640 square feet.
   c. The living areas for minor or major additions in primary dwellings shall not include bedrooms.

6.7 Finding Reports

A. Finding Reports shall be signed and stamped by a Qualified Consultant.

B. Finding Reports shall include, but not be limited to, the following information:

1. A site map including the parcel, assessor's parcel number, the located septic tank, the dispersal system, the replacement area, a north arrow, direction of slope, and scale or measurements to relevant features on the property.

2. The dispersal system shall be located if the structural improvement and/or associated construction activity has the potential to damage or adversely affect the primary and/or replacement dispersal system.

3. Indicate the bedrooms/units/structures served by the system. Documentation of structure may be derived from building permits and/or assessor records.

4. Evaluation of system performance including at least one of the following:

    a. uncovering distribution boxes to insure that the system is functioning adequately
    b. hydraulic load test
    c. pump test or
    d. evaluation of profile holes.

5. Estimated age of system.

6. Estimated sizing of system.

7. Reserve replacement area availability.

8. Inspection of all tanks and recent pumpers report (within last 5 years); this should include presence or absence of baffle walls, inlet and outlet tees, effluent levels on the inlet and outlet sides of the tank, root intrusion and cracks in the tank.

9. A completed monitoring form for nonstandard systems.

10. Classification of system.

C. Finding Reports Required. A Finding Reports shall be required for the following:

1. B-BLDs that are subject to the criteria for a code compliant OWTS proposed site improvements.

2. B-BLDs that are subject to the criteria for a legal non-conforming OWTS site improvements that received OWTS permit final construction approval more than 20 years before the date of the B-BLD application.

3. Non-standard OWTS, subject to an Operational Permit, when either of the following occur:

    a. Lack of consistent monitoring performed by owner/operator
    b. PRMD inspection corrections have not been addressed
    c. Indication that the system is exceeding flows (per self-monitoring forms and/or PRMD inspections
    d. Reserve replacement area has been compromised based on inspections.

4. OWTS subject to Code Enforcement action.

6.8 Hydraulic Load Test Guidelines

A. Septic Tank Hydraulic Load Test

The septic tank hydraulic load test, as described here, is conducted only for standard gravity-fed leachfields, and does not apply if the system utilizes a pump. A separate pump test procedure is described below. The hydraulic load test is conducted after completion of a review of background data, an initial field performance and the septic tank inspection. The hydraulic load test is conducted by surcharging the septic tank with approximately 150 gallons of water over a 20-30 minute period; and then observing the rise in water in the tank and the subsequent draining process. Tracer dye may be used to assist in observing leachfield failure.

A garden hose discharging into the outlet side of the tank can be used to surcharge the tank. The hose outlet should remain well above the water level of the tank to prevent cross- contamination. Before starting the test, the flow rate from the hose should be determined (i.e., with a 5-gallon bucket and stop watch) to properly gauge the amount of surcharge water added to the tank. Alternately, a portable water meter can be installed between the house faucet and the hose to directly measure the water volume added.

B. Test Procedures

The step-by-step procedures for the hydraulic load test are then as follows:

1. Measure the location of the static water line in the septic tank (at the outlet side) as an initial reference point.

2. Begin surcharging the tank with water to start the hydraulic load test.

3. Observe any rise in the liquid level at the outlet pipe and measure the water level at the end of filling. Typically, the liquid level will rise from 0.5 to 1-inch, at which point the liquid level should stabilize for the remainder of filling; and the

return to the initial level in a matter of minutes after filling is stopped.

4. After the filling cycle is finished, the water level decline in the septic tank is observed until the initial level is reached; and the time to achieve this is recorded. If the initial level is not attained within 30-minutes, the test is terminated and the final water level is noted.

C. System Rating

Based upon the water level readings during the test, a hydraulic performance rating shall be assigned to the system in accordance with the guidelines provided in the following table. It should be emphasized that these are guidelines only, and special circumstances may be caused for modifying the evaluation and rating of particular systems. A system receiving a “Failed” rating shall require appropriate upgrading.

D. Pump Systems

The pump test is conducted by adding sufficient water to the basin to activate the pump “on” control and observing the performance of the system over at least one pumping cycle. The total amount of water added should be about 150 gallons, to approximate no edits hydraulic loading of the leachfield as for gravity systems. Using a garden hose, the water may be added to the outlet side of the septic tank, or directly to the pump basin. If filling the basin directly, care should be taken to minimize turbulence and disturbance of sediment or sludge that may have collected in the basin. This can be best accomplished by directing the stream of water against the interior side of the chamber, rather than directly toward the bottom of the pump chamber.

Observe the filling of the basin, and note and measure the point at which the pump is activated. Immediately stop the filling operation and observe the pumping cycle until the pump shuts off. While the pump is discharging, examine the piping system for any leaks. Note and measure the depth at which the pump shuts off, and calculate the volume of water between the “on” and “off” measurements. Compare this dose with the design dose volume specified for the system. If the dose is too high or too low, float controls should be done by a licensed and properly qualified contractor.

The pumping cycle (from “on” to “off”) levels should be timed and the results recorded on the inspection form. Typically, if the pump is sized and operating properly, pump operation lasts 1-5 minutes per dose. Pump cycles lasting longer than this may indicate leachfield clogging and/or pump deficiencies. If this is observed, it should be noted and further investigation of the pump and leachfield should be conducted to determine the specific cause.

If during filling of the basin, the pump does not activate when water reaches the high liquid level control (i.e. “on” float), discontinue the pump test. This indicates a pump failure, defective float switch or wiring problems and will require the repair

service of a competent contractor familiar with these types of systems. The pump system failure should be noted, communicated immediately to the resident/owner and follow-up with a notice requiring prompt corrective action.

E. Final Leach Field Inspection

At the completion of the hydraulic load test, the drainfield area and downslope areas should be checked again for indications of surfacing effluent, wetness, or odors. If any of these conditions exist as a result of the hydraulic load test, this shall be considered conclusive evidence of system failure. If the field observations of wetness are not obviously the result of the hydraulic load test, further investigation may be necessary to determine if the drainfield is failing and the cause of the failure. Additional investigative work may include water quality sampling (for total and fecal coliform, ammonia and nitrate) or dye testing. The cause of seepage could be related to gopher holes, site drainage or erosion problems, excessive water use or simply the age of the dispersal system.

F. Clean Up

At the completion of the OWTS inspection and testing, the inspector shall replace all access lids and clean all tools before leaving the site. All tools and equipment that come in contact with wastewater should be cleaned and disinfected with a 1:5 bleach solution: and all contaminated rinse water shall be disposed of in the septic tank.

Table 6.8 Hydraulic Load Test Rating Guidelines

Rating	Septic Tank Response to Hydraulic Loading
Excellent	No noticeable rise in water level during filling
Good	Maximum water level rise of about 1-inch, with rapid decline to initial level within about 5-minutes after end of filling.
Satisfactory	Maximum water level rise of about 2-inches, with decline to initial level within about 15-minutes after end of filling.
Marginal	Maximum water level rise of about 3-inches, with decline to initial level within about 30-minutes after end of filling.
Poor	Water level rise of more than 3-inches, with decline not reaching initial level within 30-minutes after end of filling.
Failed	Water level rise of more than 3-inches, with no noticeable decline within 30-minutes after end of filling.

Section 7 Site Evaluation Methods and Investigation Requirements

7.1 Site Evaluations

A. Site evaluations are required for new or replacement OWTS.

B. Site evaluations shall be conducted by Qualified Consultants experienced in OWTS. Qualified Consultants shall coordinate site evaluations with the Permit Authority.

C. Site evaluations shall be conducted in accordance with regulations and Permit Authority policies.

7.2 General Site Criteria

A. General site criteria include, but are not limited to, the following:

1. Land area available for primary dispersal area
2. Land area available for replacement area
3. Ground Slope
4. Soil Depth
5. Depth to Groundwater
6. Soil Percolation Rates (Tables 7.2a, 7.2b and 7.9)
7. Setback Distances (Table 7.2c)
8. Location of cut banks, fills, or evidence of past grading activities, natural bluffs, sharp changes in slope, soil landscape formations, rock outcrops, trees and unstable land forms within 50 feet of the dispersal and replacement areas.
9. Location of wells, intercept drains, streams, springs and other bodies of water on the property in question and within 100 feet on adjacent properties.
10. Other information may be necessary to evaluate the suitability of the proposed OWTS.

B. Altered Terrain

1. OWTS shall not be placed in areas that have been filled, excavated, ripped, plowed altered, modified, or in areas of flooding, drainage problems, or geologic instability.

2. Such areas that have been excavated, ripped, plowed, altered, and/or modified may be acceptable if the soil is stable and soil evaluation indicates characteristics acceptable for installation of an OWTS such as approved structure, texture, consistency, pore space, percolation rate.

C. Potential Land Instability

1. If the Permit Authority determines the OWTS may cause a land instability concern, a soils report, prepared at the applicant's expense, by a California licensed engineering geologist, geotechnical engineer or registered geologist shall be required.

D. Setback Requirements

1. All new and replacement OWTS shall conform to the setback distances detailed in Table 7-2a below.

7.3 Soil Profile/Groundwater/Percolation Test Notification

A. An appointment shall be made with the Permit Authority to schedule the preliminary soil profile evaluation, percolation test and/or groundwater determination. The property owner or Qualified Consultant shall make the appointment with the Permit Authority. The Sonoma County Request for Service Form (Appendix A) shall be filled out and the filing fee shall be submitted at this time. A copy of the Assessor's Parcel Map, one plot plan and a vicinity map shall be submitted with the Request for Service form and the parcel shall be clearly marked in the field.

B. The Permit Authority shall be notified a minimum of 24 hours in advance to schedule (on a normal working day before 12:00 noon) of profile hole preparation, any percolation testing, backhoe excavations, ground water determination testing and/or other exploratory work that is being attempted.

C. The Qualified Consultant is responsible to request the soil percolation test.

Table 7.2a Sewage Application/Soil Loading Rates (gal/sq ft/day)

1-3 MPI = 1.200 gal/sq ft/day	47 MPI = 0.437 gal/sq ft/day
4 MPI = 1.143 gal/sq ft/day	48 MPI = 0.430 gal/sq ft/day
5 MPI = 1.086 gal/sq ft/day	49 MPI = 0.423 gal/sq ft/day
6 MPI = 1.029 gal/sq ft/day	50 MPI = 0.417 gal/sq ft/day
7 MPI = 0.971 gal/sq ft/day	51 MPI = 0.410 gal/sq ft/day
8 MPI = 0.914 gal/sq ft/day	52 MPI = 0.403 gal/sq ft/day
9 MPI = 0.857 gal/sq ft/day	53 MPI = 0.397 gal/sq ft/day
10 MPI = 0.800 gal/sq ft/day	54 MPI = 0.390 gal/sq ft/day
11 MPI = 0.786 gal/sq ft/day	55 MPI = 0.383 gal/sq ft/day
12 MPI = 0.771 gal/sq ft/day	56 MPI = 0.377 gal/sq ft/day
13 MPI = 0.757 gal/sq ft/day	57 MPI = 0.370 gal/sq ft/day
14 MPI = 0.743 gal/sq ft/day	58 MPI = 0.363 gal/sq ft/day
15 MPI = 0.729 gal/sq ft/day	59 MPI = 0.357 gal/sq ft/day
16 MPI = 0.714 gal/sq ft/day	60 MPI = 0.350 gal/sq ft/day
17 MPI = 0.700 gal/sq ft/day	61 MPI = 0.345 gal/sq ft/day
18 MPI = 0.686 gal/sq ft/day	62 MPI = 0.340 gal/sq ft/day
19 MPI = 0.671 gal/sq ft/day	63 MPI = 0.335 gal/sq ft/day
20 MPI = 0.657 gal/sq ft/day	64 MPI = 0.330 gal/sq ft/day
21 MPI = 0.643 gal/sq ft/day	65 MPI = 0.325 gal/sq ft/day
22 MPI = 0.629 gal/sq ft/day	66 MPI = 0.320 gal/sq ft/day
23 MPI = 0.614 gal/sq ft/day	67 MPI = 0.315 gal/sq ft/day
24 MPI = 0.600 gal/sq ft/day	68 MPI = 0.310 gal/sq ft/day
25 MPI = 0.593 gal/sq ft/day	69 MPI = 0.305 gal/sq ft/day
26 MPI = 0.587 gal/sq ft/day	70 MPI = 0.300 gal/sq ft/day
27 MPI = 0.580 gal/sq ft/day	71 MPI = 0.295 gal/sq ft/day
28 MPI = 0.573 gal/sq ft/day	72 MPI = 0.290 gal/sq ft/day
29 MPI = 0.567 gal/sq ft/day	73 MPI = 0.285 gal/sq ft/day
30 MPI = 0.560 gal/sq ft/day	74 MPI = 0.280 gal/sq ft/day
31 MPI = 0.553 gal/sq ft/day	75 MPI = 0.275 gal/sq ft/day
32 MPI = 0.545 gal/sq ft/day	76 MPI = 0.270 gal/sq ft/day
33 MPI = 0.538 gal/sq ft/day	77 MPI = 0.265 gal/sq ft/day
34 MPI = 0.531 gal/sq ft/day	78 MPI = 0.260 gal/sq ft/day
35 MPI = 0.523 gal/sq ft/day	79 MPI = 0.255 gal/sq ft/day
36 MPI = 0.516 gal/sq ft/day	80 MPI = 0.250 gal/sq ft/day
37 MPI = 0.509 gal/sq ft/day	81 MPI = 0.245 gal/sq ft/day
38 MPI = 0.501 gal/sq ft/day	82 MPI = 0.240 gal/sq ft/day
39 MPI = 0.494 gal/sq ft/day	83 MPI = 0.235 gal/sq ft/day
40 MPI = 0.487 gal/sq ft/day	84 MPI = 0.230 gal/sq ft/day
41 MPI = 0.479 gal/sq ft/day	85 MPI = 0.225 gal/sq ft/day
42 MPI = 0.472 gal/sq ft/day	86 MPI = 0.220 gal/sq ft/day
43 MPI = 0.465 gal/sq ft/day	87 MPI = 0.215 gal/sq ft/day
44 MPI = 0.457 gal/sq ft/day	88 MPI = 0.210 gal/sq ft/day
45 MPI = 0.450 gal/sq ft/day	89 MPI = 0.205 gal/sq ft/day
46 MPI = 0.443 gal/sq ft/day	90-120 MPI = 0.200 gal/sq ft/day

Table 7.2b Illustrative Table for Sizing Absorption Area

Texture	Structure		Hydraulic loading (Gal/ft^2/day)	
	Shape	Grade	STE[1]	PTE1.2
Coarse sand, sand, loamy coarse sand	Single grain	Structureless	1.2	1.6
Fine sand, loamy fine sand	Single grain	Structureless	0.6	1.0
Sandy loam, loamy sand	Massive	Structureless	0.35	0.5
	Platy	Weak	0.35	0.5
	Prismatic, blocky, granular	Weak	0.5	0.75
		Moderate, strong	0.8	1.0
Loam, silt loam, sandy clay loam, fine sandy loam	Massive	Structureless		
	Platy	Weak		
	Prismatic, blocky, granular	Weak, moderate	0.5	0.75
		Strong	0.8	1.0
Sandy clay, silty clay loam, clay loam	Massive	Structureless		
	Platy	Weak, moderate, strong		
	Prismatic, blocky, granular	Weak, moderate	0.35	0.5
		Strong	0.6	0.75
Clay, silty clay	Massive	Structureless		
	Platy	Weak, moderate, strong		
	Prismatic, blocky, granular	Weak		
		Moderate, strong	0.2	0.25

1: STE=septic tank effluent; PTE=pre-treated effluent
2: Higher hydraulic loading rates for pretreated effluent may only be used when pretreatment is not used for one foot of vertical separation credit

Table 7.2c Setback Requirements

Minimum horizontal distance required from:	Septic Tank (All Systems) (feet)	Dispersal Area (Standard) (feet)	Dispersal Area (Non Standard) (feet)
Building or structures (including driveways, parking areas and paved areas) Upgradient Laterally Downgradient	5 5 5	8 8 8	10 10 25
Property line and/or easements Upgradient Laterally Downgradient	5 5 5	5 5 5	10 10 25
Water supply wells and springs	50 (Note 1)	100	100
Public water Supply Wells: Dispersal depth <= 10 ft Dispersal depth > 10 ft	50 (Note 1) 50 (Note 1)	150 200	150 200
Public Water Supply Surface Intake: Less than 1200 ft to OWTS Less than 2500 ft to OWTS	50 (Note 1) 50 (Note 1)	400 200	400 200
Perennially flowing streams (as measured from the edge of the waterbody's natural or levied bank)	50	100	100
Ephemeral streams (as measured from the edge of the watercourse) and ephemeral water bodies	25	50	50
Drainage ways > 18" in depth	25	50	50
Drainage ways <= 18" in depth	15	15	25
Intercept Drains – Perforated Upgradient Laterally Downgradient	15 25 25	15 50 50	15 50 50
Non-Perforated / Solid Drain Pipes Upgradient Laterally Downgradient	5 10 10	10 15 15	10 15 15
Ocean, lakes, ponds or reservoir (as measured from the high waterline)	50	100	100
Large trees	10	Considered on a case by case basis	Considered on a case by case basis
Dispersal field	5	----	----
Domestic water pipe*	5	5	5

Minimum horizontal distance required from:	Septic Tank (All Systems) (feet)	Dispersal Area (Standard) (feet)	Dispersal Area (Non Standard) (feet)
Pressure Public Water Main*	5	10	10
Distribution box	5	4	----
Fill areas	------	15	15
Cut banks (manmade excavation of the natural terrain >3 feet), natural bluffs, sharp changes in slope.			
Soil or groundwater depth below dispersal area is ≥ 5 ft	25	25	25
Soil or groundwater depth below dispersal area is < 5 ft	25	50	50
Title 22 recycled water dispersal area	5	Per RWQCB requirements	Per RWQCB requirements
Swimming pools (down gradient)	5	8	25
Note 1: Septic tank and sump shall be watertight.			
Note *: Bottom of water pipe shall be ≥ 12" above top of sewer/drain line. Water pipe placed on a solid shelf excavated at one side of the common trench with a minimum horizontal distance of ≥ 12" (2007 CA Plumbing Code Table K-1)			

D. The Qualified Consultant may choose to perform the soil percolation test at the same time as the soil profile evaluation. Combining of these two steps must be authorized by the Permit Authority in advance of the work.

E. All percolation tests, groundwater determination tests, and information obtained related to the percolation test procedures shall be submitted to the Well and Septic Section within 90 days of the completion of all on-site testing. This includes any test information data or results that may not prove acceptable for sewage dispersal design (extensions may be requested on a case by case basis).

7.4 Soil Profile Evaluations

A. Soil profile holes for the Preliminary Site Survey Soil Profile Evaluation typically are constructed prior to any soils percolation testing and/or groundwater determination tests.

1. Wet weather percolation testing and/or groundwater determination tests prior to soil profile evaluations are allowed, however the tests are considered incomplete, pending approval of the soil profile investigation.

B. Profile holes must be adequately covered to prevent entrance if left unattended and backfilled immediately after completion of test procedures. Note: Work is permissible on sites to locate potentially acceptable areas prior to the preliminary evaluation.

C. Soil profiles holes are for the purpose of observing soil structures, texture, formations; the presence of seasonal groundwater; impervious rock formations, etc. Profiles are essential in the evaluation of any parcel for soil suitability for private sewage dispersal systems.

D. A minimum of two (2) soil profile holes will be excavated with a backhoe. One profile hole shall be excavated in the primary effluent dispersal area and one in the reserve replacement area shall be required to demonstrate the suitability of soil conditions. More soil profile holes may be required to demonstrate suitable soil conditions for both the primary dispersal area and the reserve replacement area if the initial two profiles show dissimilar conditions.

E. The profile holes shall be dug to a depth of at least three feet below the proposed absorption surface (trench bottom or two feet below the basal area of a mound).

   1. Soil depth is measured vertically to the point where bedrock, hardpan, impermeable soils, rock content greater than 50%, or saturated soils are encountered.

   2. For soils having less than 15% silt and clay, a minimum depth to groundwater below the leaching trench shall be five (5) feet.

   3. For soils having greater than 15% silt and clay, the minimum soil depth and depth to groundwater below the leaching trench shall be three feet.

      a. Lesser soil depths may be granted only as a variance or for Non-Standard Alternative OWTS.

F. Augured profile holes are an acceptable alternative only (1) where use of a backhoe is impractical because of access, (2) when necessary to verify conditions expected on the basis of prior soils investigations, or (3) when done with geologic investigations (the extracted soils shall be arranged for evaluation so that corresponding depths can be determined). Where this method is employed, three profile holes in the primary area and three in the expansion area are required, the same as percolation test hole requirements).

G. The classification of soils into zones as shown in the USDA Soils Classification Triangle will be the primary reference on acceptability of soils for OWTS. (see Figure 7.4)

H. The following factors are to be observed and reported from ground surface to a depth corresponding to the groundwater determination and soil percolation test requirements:

   1. Thickness and coloring of soil layers, structure and texture using the United States Department of Agriculture (USDA) classification.

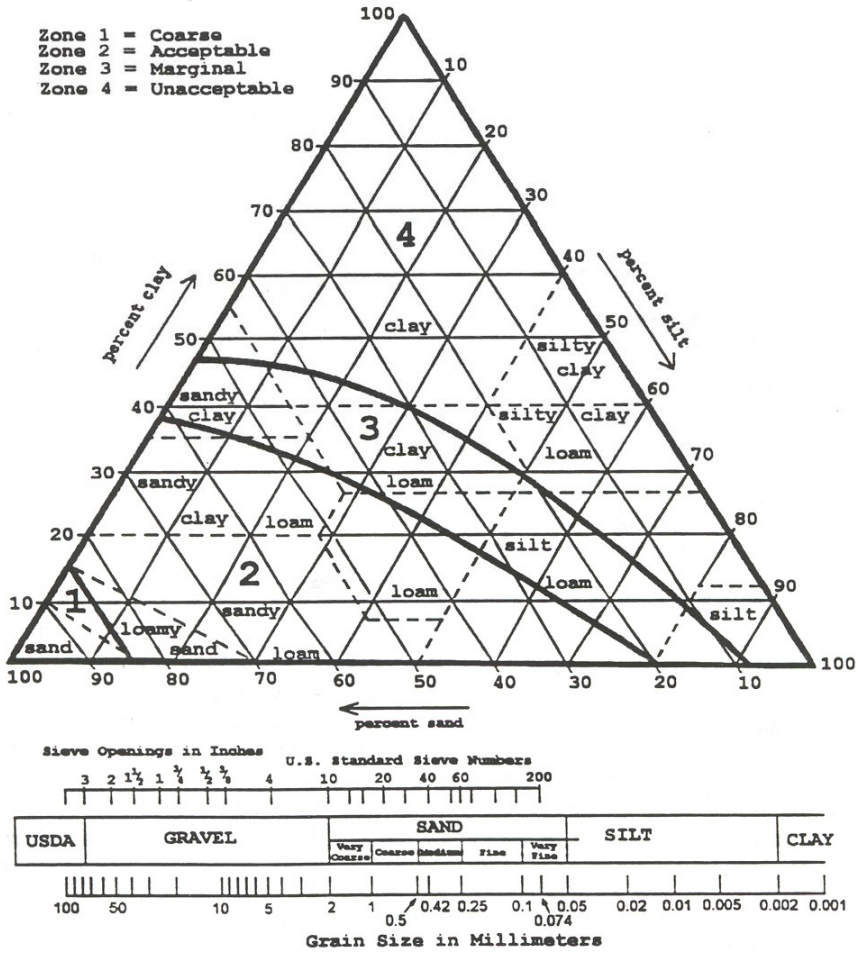
   2. Depth to and type of bedrock, hardpan, or impermeable soil layer.

   3. Depth to observed ground water, saturated soil layers and areas of water infiltration.

   4. Depth to soil mottling.

   5. Other prominent soil features such as structure, stoniness, roots and pores, dampness, soil boundaries, etc.

Figure 7.4 Soil Percolation Suitability Chart for OWTS



Instructions:

1. Plot texture on triangle based on percent sand, silt, and clay as determined by hydrometer analysis.
2. Adjust for coarse fragments by moving the plotted point in the 100 percent sand direction an additional 2% for each 10% (by volume) of fragments greater than 2mm in diameter.
3. Adjust for compactness of soil by moving the plotted point in the 100 percent clay direction an additional 15% for soils having a bulk-density greater than 1.7 gm/cc.

Note: For soils falling in sand, loamy sand, or sandy loam classification bulk density analysis will generally not affect suitability, and analysis is not necessary.

7.5 Groundwater Table Determination

A. General Provisions:

Groundwater table determinations are required for lands having slopes of 0 to 5% in a basin area. Groundwater determinations on lands greater than 5% slope may be required if high seasonal groundwater is suspected.

B. Groundwater Table Determination Methods

Groundwater table determination can be made by one of following methods:

1. Direct observations via backhoe pits or auger holes;

2. Direct observation via existing water wells or monitoring wells;

3. Indirect observation via soil mottling; or

4. Compilation of approved readings or observations from any of the first three methods from adjacent or neighboring parcels and/or projects.

5. Other alternate methods as approved by the Permit Authority.

C. Direct Groundwater Table Determination Calendar

1. Direct groundwater table determinations shall be conducted between January 1 and March 1, after having received 50% of the average seasonal rainfall for each defined geographic area, as listed in Table 7.5 and depicted in Map 7.5, and within 10 days of receipt of 0.8 inch or more of rainfall within a 48 hour period as reported by the officially recognized reporting stations as published in the Press Democrat.

2. Time extensions for direct groundwater table determinations may be authorized by the Permit Authority based on extended periods of rainfall before January 1 and/or after March 1.

D. Direct Groundwater Table Observation Construction Methods

1. Backhoe excavated profile holes shall remain open a minimum of 24 hours, adequately supervised or barricaded until observed by the Permit Authority.

2. An alternative to leaving the holes open for 24 hours, is to insert a perforated pipe in the hole and place native backfill around the pipe (the backfill may not be compacted).

3. Another acceptable alternative is to hand dig or bore a hole to at least 36 inches below the proposed percolation test depth, insert a perforated pipe, and

fill the annular space with gravel covered with two feet of native soil. This hole may then be used to monitor groundwater levels 24 or more hours later. Note Additional holes at lesser depths to augment the data or prove multiple water table depths are encouraged, as is recordation of water levels throughout the wet-weather period.

4. Groundwater holes shall be protected to prevent sheet flow runoff, rainfall or other sources of non-groundwater from entering the observation hole.

5. The minimum depth to the anticipated highest level of groundwater that occurs over an extended period of time below the bottom of the leaching trench, shall be determined according to soil texture and percolation rate. Where groundwater is determined to be non-usable, e.g. cannot reasonably be expected to be used for withdrawal and beneficial use due to quantity and/or quality, a minimum depth to groundwater of three feet below the leaching trench bottom may be permitted without need for a variance, if soils contain greater than 15% silt and clay as demonstrated by hydrometer analysis, or soils having a percolation rate slower than 5 mpi. This depth may be waived to no less than two feet if variance is justified or for an approved Non-Standard System.

E. Direct Groundwater Table Determination

1. The observation hole shall remain in place and undisturbed for a minimum of 24 hours to allow infiltration of groundwater.

2. Qualified Consultant shall measure and record the depth to groundwater from the undisturbed or pre-existing ground surface.

3. The observation hole(s) shall be labeled and labelling shall be consistent with associated map(s) and/or submittals to the Permit Authority.

F. Indirect Groundwater Table Determination Method

1. Soil mottling observations may be utilized as an alternative to direct wet-weather groundwater table determinations in the following circumstances.

   a. Replacement dispersal systems.

   b. Soil characteristics, primarily the presence of iron and/or manganese, that lend themselves to redoximorphic processes.

   c. Soil sampling shall be required if soil mottling is not observable to both the Qualified Consultant and Permit Authority staff.

   d. Existing, legally established parcels.

2. Soil mottling observations shall not be utilized for properties with failed or canceled groundwater determinations on file.

3. A soil profile evaluation of sufficient means to determine the observable depth of soil mottling is required for this procedure.

4. Soil mottling shall be observed by the Qualified Consultant and Permit Authority. The field procedure will be similar to a Pre-Perc where the Qualified Consultant shall schedule a time to meet onsite with the Permit Authority and shall coordinate the excavation and backfilling of soil profile pits.

G. Compilation Method

The compilation method may be used provided the following criteria are meet:

1. Soil profile readings or observations are within 500 feet of the proposed OWTS; and,

2. Area conditions lend themselves towards using off-site data or data not directly associated with the proposed OWTS. Area conditions include, but is not limited to, topography, slope, geology, geography, cut banks, natural bluffs, rock outcrops, landslides, springs, streams, roads; and,

3. Soil profile readings or observations were made by both a Qualified Consultant and the Permit Authority within the past three years; and,

4. Soil profile readings or observations have been submitted and approved by the Permit Authority.

H. Conflicts Between Methods

Where a conflict in the above methods exists, the Permit Authority shall decide the appropriate method. Considerations shall include soil characteristics, rainfall and/or drought conditions, historical records and written reports.

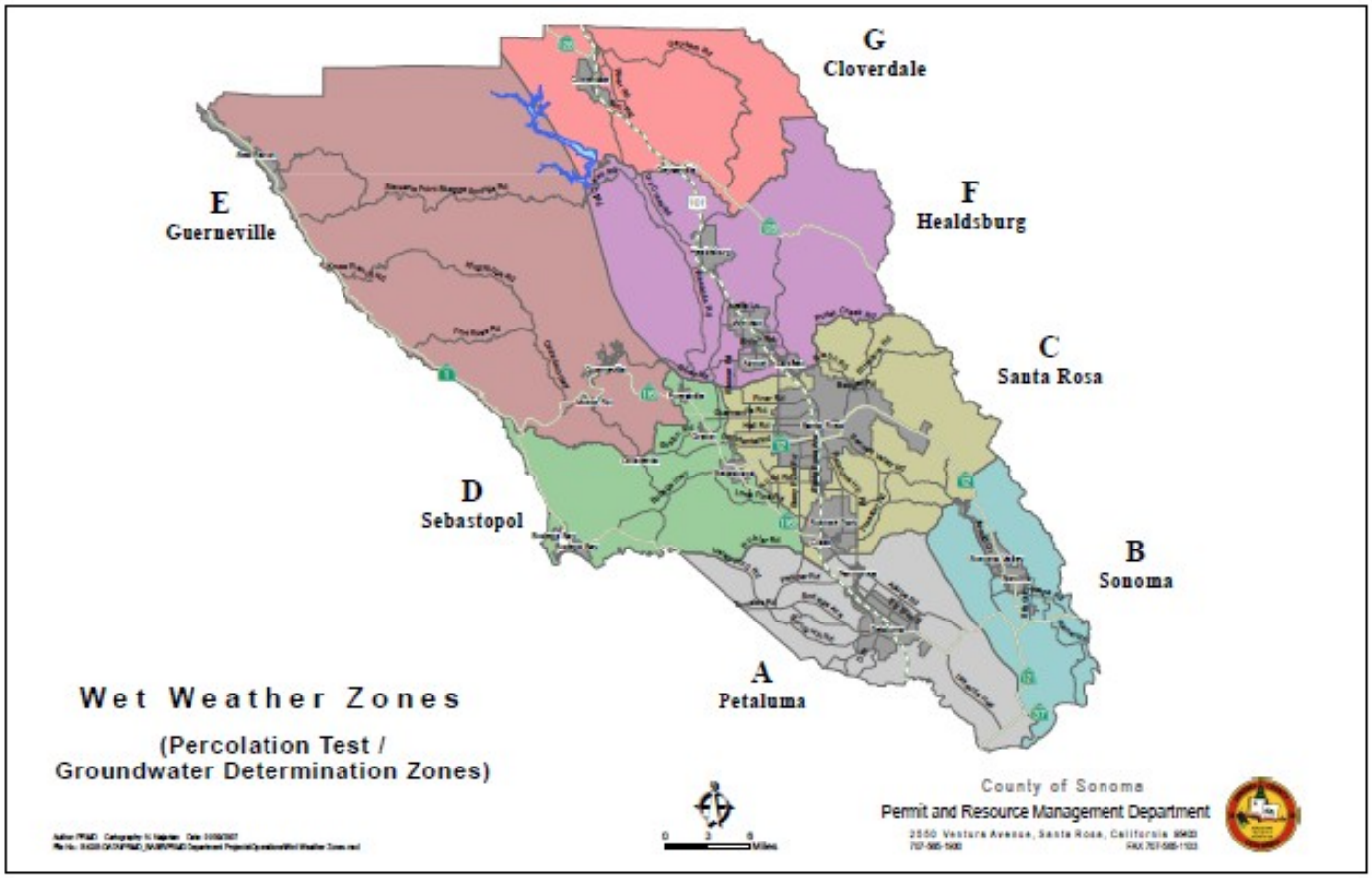
I. Table 7.5, below, presents fifty percent (50%) of the average annual rainfall by Wet Weather Zone.

Table 7.5
50% of Average Annual Rainfall by Zone

~~AREA~~ Wet Weather Zone	50% of Annual Rainfall
Petaluma (Area A)	12.5 inches
Sonoma (Area B)	15 inches
Santa Rosa (Area C)	15 inches
Sebastopol (Area D)	17.5 inches
Guerneville (Area E)	25 inches
Healdsburg (Area F)	20 inches
Cloverdale (Area G)	20 inches

J. Map 7.5, below, shows the Wet Weather / Groundwater Determination Zones.

Map 7.5 Wet Weather/Groundwater Determination Zones



7.6 Percolation Test Suitability

A. Site suitability for effluent dispersal for an undeveloped parcel shall be determined by a percolation test. Site suitability for effluent dispersal for a developed parcel shall be determined by a percolation test or soil analysis.

B. Private sewage dispersal sites require a minimum of six or more holes spaced uniformly throughout the area chosen for the proposed leaching field and leaching field expansion area.

C. The location of test holes must take into consideration the minimum distances which will govern construction of an OWTS.

D. Additional requirements, determined on an individual basis, may be required for specially designed or non-standard on-site sewage dispersal systems when permitted.

7.7 Percolation Test Hole Construction

A. Percolation test hole construction requirements are as follows

1. Dig or bore holes four, six or eight inches in diameter, to the vertical depth of the proposed trench and at least 12 inches below any proposed effluent pipe (refer to **Tables 7.8a and b** and **Figures 7.8a and b**).

2. After holes are dug, remove all loose material possible after carefully scraping the bottom and sides to remove any smeared soil surfaces. Add clean pea-gravel (maximum of 1 inch) to stabilize the hole, insert a perforated pipe (3 or 4 inch diameter) and place pea-gravel around exterior of pipe at least 12 inches, or up to ground surface. At the bottom of any backhoe excavations used, a secondary 6 or 8 inch diameter hole is to be bored to the depth of the proposed trench in *undisturbed* soil, providing that the depth shall not be less than 12". Do not back fill soil around pipe in backhoe holes. Measure and record the length of the pipe on the report form.

Table 7.8a
Percolation Test Hole Depth Requirements (Standard OWTS)

Standard OWTS Slope at Hole	Standard OWTS Depth of Holes
Standard 0-12.5% [1]	30” (Minimum)
Standard 12.5%-30% [1]	36” (Minimum)
Filled Land (0-20%)	24”
Shallow Sloping (12.5-30%)	36”
[1]: Deeper percolation testing may be required if there is dissimilar soil types below the bottom of the trench.	

Table 7.8b
Percolation Test Hole Depth Requirements (Non-Standard OWTS)

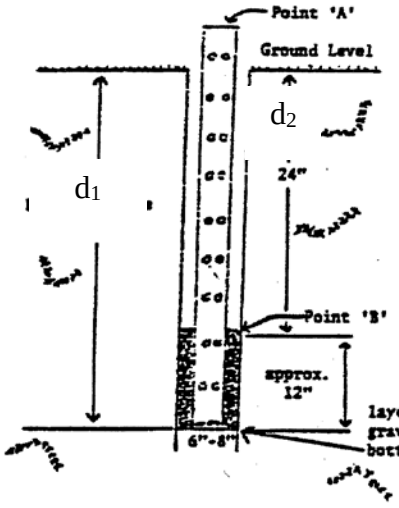
Non-Standard OWTS Slope at Hole	Non-Standard OWTS Depth of Holes
Mound (0-20%)	24” (Minimum)
STPD (0-20%)	24” (Minimum)
STPD (20-25%)	30” (Minimum)
STPD (25-30%)	36” (Minimum)
STPD (up to 30%)	60” (Maximum)
At-Grade	12, 24, and 36”
Drip Dispersal	6-12” and 24” below pipe depth
Shallow In Ground	10-14” and 24” below pipe depth
Gravel-less Pressurized Dispersal Channel (GPDC)	10-14” and 24” below pipe depth

Figure 7.8a Percolation Test Hole Requirements

Example A

EXAMPLE

TYPICAL PERCOLATION TEST HOLE ON 12% SLOPE



Materials needed to conduct a percolation test:

1. 3 or 4 inch diameter perforated pipe
2. Fine gravel (pea)
3. Metal tape measure
4. 6" or 8" soil auger
5. water supply

Measurements:

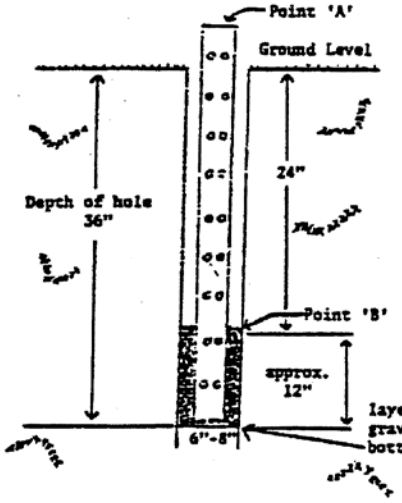
1. Record length of pipe and depth of hole
2. Record presoak remaining to the nearest 1/8 inch
3. Record measurements from Point 'A' to Point 'B' (from top of pipe to top of water)
4. Adjust water level to 12 inches above gravel at bottom of hole

NOTE: The depth of the percolation hole will vary according to slopes on site, and whether the system proposed is a standard, innovative or alternative system.

Example B

EXAMPLE

TYPICAL PERCOLATION TEST HOLE ON 12% SLOPE



Materials needed to conduct a percolation test:

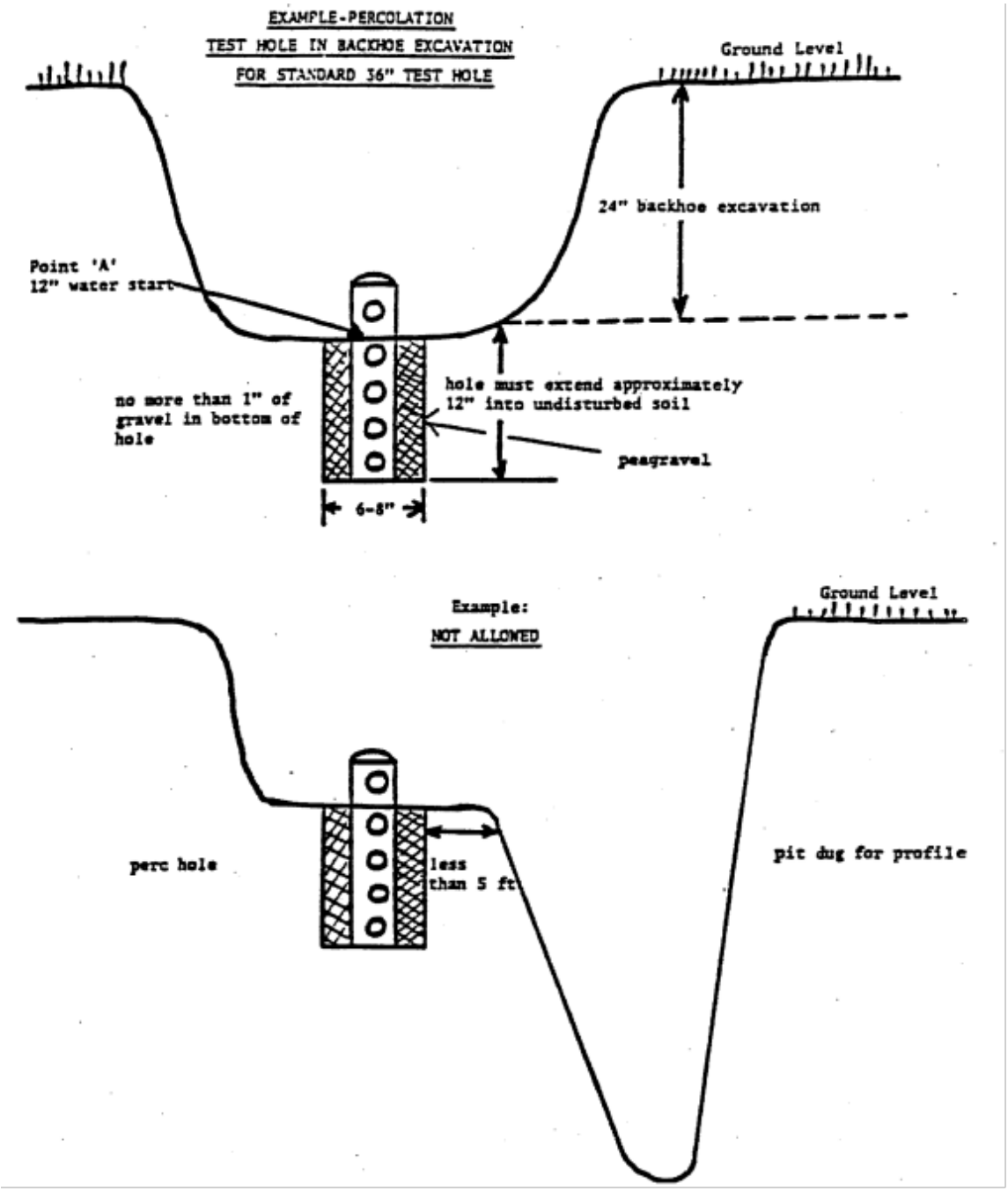
1. 3 or 4 inch diameter perforated pipe
2. Fine gravel (pea)
3. Metal tape measure
4. 6" or 8" soil auger
5. water supply

Measurements:

1. Record length of pipe and depth of hole
2. Record presoak remaining to the nearest 1/8 inch
3. Record measurements from Point 'A' to Point 'B' (from top of pipe to top of water)
4. Adjust water level to 12 inches above gravel at bottom of hole

NOTE: The depth of the percolation hole will vary according to slopes on site, and whether the system proposed is a standard, innovative or alternative system.

Figure 7.8b Percolation Test Hole



7.8 Percolation Test Procedures

A. Presoak on the day prior to conducting the tests, fill the holes completely with clear water to which no substances have been added and refill at least four (4) times. An alternate procedure is a continuous 12-hour presoaking employing a reservoir and continuous head device. Presoaking for wet-weather tests is not necessary if the tests are performed during the 10 day period in which wet-weather groundwater determinations are allowed.

B. Percolation Rate Measurements Percolation-rate measurements shall be made on the day following the presoaking of test holes.

   1. When water remains from presoaking, record the inches of water remaining on the report form and adjust the water level to 12 inches over the gravel base. Measurements are then taken from a fixed point at the top of the pipe to the top of the water and like measurements taken each hour for six hours. Record measurements accurately, vertically, and to the nearest 1/8 inch.

   2. When no water remains from presoaking, gently add clear water to the hole to a depth of 12 inches over the gravel base. Measure the drop in the water level from a fixed point at the top of the pipe to the top of the water each hour for six hours. Additional water may be added to 12 inches above the gravel when the hole is empty, or after any reading that indicates the water is less than 2 inches above the gravel. Record the new water elevation and continue measurements for duration of initial six-hour test. Record measurements to the nearest 1/8 inch.

   3. When hole is dry before the first 60 minutes upon start of test measurements, add clear water to 12 inches over the gravel base and take measurements every ten minutes for two hours. The 12 inches of water is to be replaced at any time the hole is empty or the water depth is less than 2 inches.

7.9 Percolation Rate Interpretation

A. An average stabilized percolation rate of at least one inch per hour is required for the installation of a standard OWTS. Stabilized rates slower than one inch per hour or less than one minute per inch may be considered for inclusion within the Experimental or Alternative Non-Standard OWTS Program (Sections 12 and 13). Refer to Tables 7.2a. and 7.9.

B. The drop in the water level that occurs between the fifth and sixth measurements on six-hour tests is considered to be the stabilized percolation rate. The drop in water level that occurs between the eleventh and twelfth measurements is considered to be the stabilized rate for the two-hour test. The readings during

prior periods provide information for modification of the interpretation of the average stabilized percolation rate. Prior readings will be evaluated where refilling of test holes has occurred in the last two hours of the test or when rates show significant inconsistency during the course of the tests.

C. Average percolation rates less than 5 minutes per inch will require that a soil texture analysis (hydrometer method) be performed to determine the necessary clearance from proposed trench bottom to elevated seasonal water table, unless well logs demonstrate the distance to water table to be 40 feet or greater, If soil texture analysis is performed, required clearance to water table shall be as specified in Section 7.5.

D. An average Percolation rate less than one minute per inch (<1mpi) is not suitable for the installation of an OWTS with the exception of a pretreatment and disinfection to a drip system.

Table 7.10
Percolation Rate
Conversion Chart

Inches per Hour	Rate Min per Inch	Inches per Hour	Rate Min per Inch
1/8	480	2 3/4	22
1/4	240	3	20
3/8	160	3 1/4	18
1/2	120	3 1/2	17
5/8	96	3 3/4	16
3/4	80	4	15
7/8	69	5	12
1	60	6	10
1 1/8	53	7	9
1 1/4	48	8	8
1 3/8	44	9	7
1 1/2	40	10	6
1 5/8	37	12	5
1 3/4	34	15	4
1 7/8	32	20	3
2	30	39	2
2 1/4	27	60	1
2 1/2	24		

7.10 Wet Weather Percolation Tests

A. If a soil is determined to be within Zones 3 and 4 of the soils suitability chart, “wet weather” percolation testing is automatically required, unless Plasticity Index is less than 20 (ASTM D 4318-84). (See Figure 7.4 soil suitability chart).

B. Wet-Weather soils percolation tests are percolation tests conducted between January 1 and March 1 after having received 50% of actual seasonal rainfall for each defined geographic area. See Section 7.5, Table 7.5 and, Map 7.5.

C. Extensions beyond the time limits of the above criteria may be made by the Engineering Program Manager of PRMD based on an evaluation of rainfall and groundwater monitoring and within the parameters of this section. Extensions beyond April 30 are not allowed.

D. Presoaking for wet-weather tests is not necessary if the tests are performed during the 10 day period in which wet-weather groundwater determinations are allowed.

7.11 Percolation Test Submittal of Results

A. Percolation test information shall be submitted within 90 days to the Permit Authority on the County form provided for all tests conducted including preliminary tests, failing holes and exploratory holes which were not tested.

B. All percolation test records submitted for approval of a site must be complete and shall include a written evaluation attesting to the validity of all tests by a Registered Civil Engineer, Registered Geologist, Soil Scientist or Registered Environmental Health Specialist experienced in on-site sewage dispersal systems. Records and evaluations submitted are to include at a minimum

1. Data on all excavations, including failing holes and exploration holes within a 100 foot radius of the proposed septic area which were not tested

2. Size of land area available for primary dispersal system and required replacement area, including a scaled plot plan showing the location of test holes dimensioned to property lines and delineating the area for the dispersal fields as calculated from the established percolation rate.

3. Accurate ground slope in the primary and expansion dispersal field, and areas within 50 feet.

4. Location of cut banks, natural bluffs and sharp changes in slope within

50 feet of the primary and expansion field.

5. Location of wells, springs, intercept drains, streams and other bodies of water on the property and within 150 feet of primary and expansion areas.

6. Location of existing houses, structures, rock outcrops and large trees in the area of the test.

7. Depth to groundwater when required, per Section 7.5

8. Special area standards.

9. The person verifying the validity of the tests must describe the soils encountered in the profile holes as outlined in Section 7.4, as well as attest to the fact that required presoak was performed, that the test was set up in accordance with County standards, that he/she personally observed the site and a portion of the tests, and that it is a true and accurate indication of the suitability of the site for on-site sewage dispersal as measured by the standards of Sonoma County Permit and Resource Management Department.

Section 8 Criteria for OWTS Components

8.1 Septic Tank Requirements

A. These requirements shall apply to all septic tanks in new OWTS and replacement systems.

1. Septic tanks shall be International Association of Plumbing and Mechanical Officials (IAPMO) approved. Septic tanks shall be sealed with an approved sealant so it is watertight. Wood septic tanks and metal septic tanks are prohibited.

2. Septic tanks shall have at least two compartments separated by a baffle or equivalent arrangement. The inlet compartment shall have a capacity of not less than 2/3 the total volume.

3. An inlet tee and outlet tee is required.

4. Each compartment of the septic tank shall have access provided by a manhole having not less than 24 inches in minimum dimensions with a close fitting manhole cover equipped with a durable handle to facilitate removal.

5. A clean-out to finished grade shall be provided between the structure and the septic tank.

6. Each compartment shall be provided with a riser extended from each manhole cover to the surface of the ground so as to facilitate inspection and maintenance of the septic tank. The riser shall be of equal size or larger than the manhole cover and shall be constructed of durable material. All joints shall be properly sealed with a sealant and/or an interlocking mechanism approved by PRMD.

7. A corrosion-resistant, NSF rated effluent filter approved by PRMD, capable of screening solids in excess of 3/16 of an inch in diameter, shall be provided in the outlet tee.

8. All connections from building to septic tank must conform to construction standards per the approved County Code requirements.

8.2 Septic Tank Sizing

A. The minimum liquid capacity of any septic tank installed shall be 750 gallons. Septic tanks to serve single family dwellings shall be sized on the number of bedrooms in the dwelling. The septic tank size for commercial OWTS shall be based on the peak daily sewage flow.

B. Minimum required septic tank sizing is shown in Table 8.2.

Table 8.2
Septic Tank Capacity

For residential uses, the size of septic tank is determined by the number of bedrooms as shown:	
Bedrooms	**Tank Capacity (gallons) Pre-Cast Tank**
1-2	**750**
3	**1000**
4	**1200**
5-6	**1500**
Additional Bedrooms	**250 per bedroom**
For commercial uses, the minimum size of the septic tank must be based on the formula: **V (net volume in gallons) = 1,125 + 0.75 *Q (daily wastewater flow in gallons)**	

8.3 Sump & Pump System

A. A pump system can be a supplement to an OWTS. A pump in a standard system is utilized to enable the installation of a dispersal field up-slope of the structure to be served. The effluent at the higher elevation is distributed to the dispersal field by gravity flow.

B. A pump system is a major feature in an alternative OWTS that allows intermittent balanced dosing or pressurizing of effluent in the dispersal system. Any sump and pump must be designed, inspected and hydraulically tested for proper operation by the designer and PRMD staff prior to final approval of the installation.

8.4 Sump & Pump Requirements

A. Sewage effluent sump and pump general requirements area as follows

1. Specifications for the sump and pump, including the pump performance curve, must be submitted with the design for the OWTS.

2. Design information shall include the following

   a. Relative elevations of the pump and dispersal field pipe;
   b. Total dynamic head loss through the effluent piping and valves;
   c. Pump run times;
   d. Design flow rate (gpm).

3. All sump pump systems and distribution systems must be inspected and hydraulically tested for proper operation by the designer and PRMD staff prior to final approval of the installation and occupancy of the structure.

B. Required features of the sump are as follows

1. The minimum working capacity of all sumps is 300 gallons, including

    a. The design dose volume
    b. A minimum 200 gallon additional storage capacity between the high water alarm and inlet
    c. The minimum working capacity of sumps for non-standard OWTS is 500 gallons or three (3) times the designed dose, whichever is greater.
    d. Alternative configurations may be approved for systems utilizing pretreatment and repairs if justified by the designer.

2. Concrete tanks shall be a monolithic casting or joints sealed with appropriate sealants.

    a. Concrete tanks shall be made of sulfate-resisting cement, Specification C 150, Type II or highly sulfate-resisting cement, Specification C 150, Type V or coated with an asphalt emulsion or equivalent on the inside.
    b. The coated interior shall be allowed to dry for at least 24 hours.
    c. Asphalt emulsion or tar shall not be used as joint sealants.

3. Sump tanks shall be constructed of solid durable materials, which are not subject to excessive corrosion and degradation in the presence of domestic sewage and shall be watertight.

    a. They shall meet the IAPMO construction standards for septic tanks of the said material (glass-fiber-reinforced polyester, polyethylene, synthetic fiber reinforced).
    b. Wood and/or metal tanks are not allowed.

4. All sumps shall have a riser that extends to at least 2 inches above the finished grade.

    a. Risers shall be sealed watertight to the sump chamber with materials suited for the specific application.
    b. Wood risers are not allowed.
    c. Risers and lids in traffic areas shall be traffic rated and may be flush with the ground elevation.

5. All pipes and/or electrical conduits entering the sump tank or riser shall be sealed to make the passage gas and water tight.

    a. If the pipes and/or electrical conduits enter a synthetic tank or plastic riser, rubber grommets shall be used
    b. Non-shrink grouts should be used with concrete tanks or risers.

6. Sumps on downhill runs shall be placed within 30 feet of the leach field, unless greater distances are allowed. When practical, sumps shall be located at a lower elevation than the leach field.

a. The sump tank location must be accessible for a septic tank pumper to pump the tank.

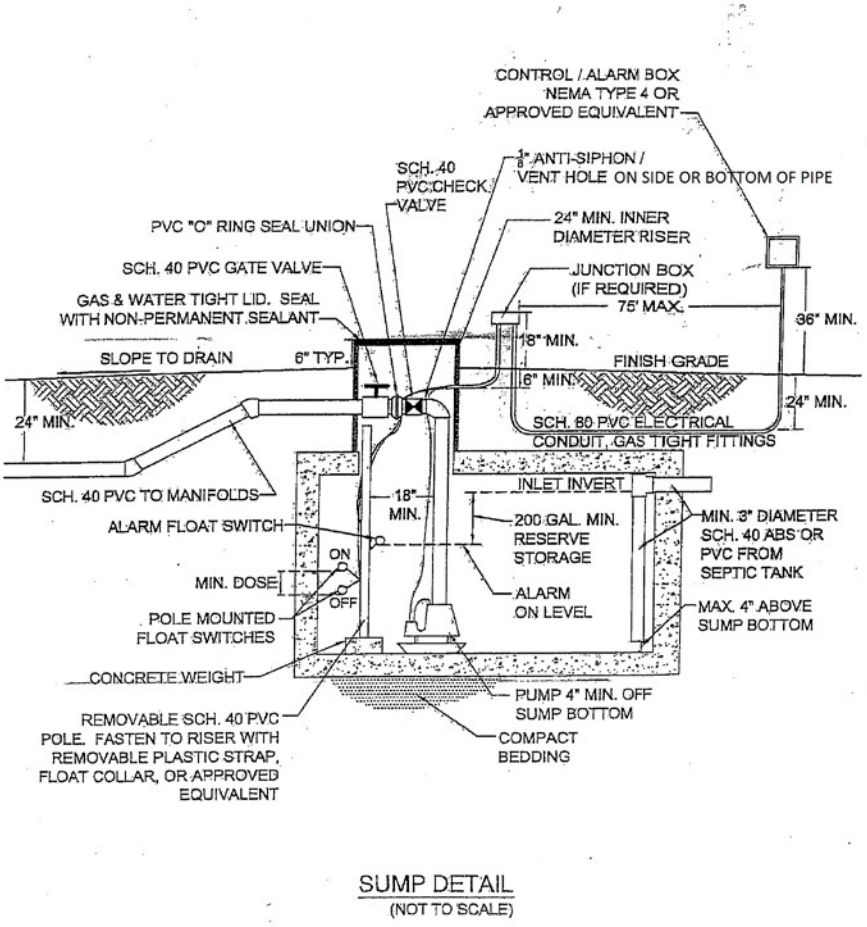
7. A pre-screening device or filter capable of screening solids in minimum 3/16 inches size shall be installed in the septic tank or sump chamber to assist in preventing suspended solids from reaching the pump.

8. Wastewater shall exit the sump only through pump and pressure lines. Gravity overflows are prohibited.

C. Required features of the pump are as follows

1. Float controls for the pump and audio/visual alarm shall be mounted to a Schedule 40 PVC pole, mounted inside a pump chamber, which can be removed for maintenance. See Figure 8.4a.

Figure 8.4a Sump Detail



SUMP DETAIL
(NOT TO SCALE)

2. Control floats shall be attached to the PVC pole by plastic tie straps or plastic float collars.

    a. Stainless steel straps will not be accepted.

3. The pump shall be mounted a minimum of 4 inches above the bottom of the sump chamber.

    a. If applicable, non-corrosive materials shall be used to support the pump.

4. For the situations where a pump must be installed in the second chamber of the septic tank, the pump shall be placed in a screened pump vault within the second chamber.

    a. Microdosing shall be required to minimize swings in the liquid level.

D. Required electrical features are as follows

1. All materials, connections, and specifications shall meet the California Electric Code.

    a. In all cases in which a sump with a pump is used for an OWTS, the contractor/owner shall obtain an electrical permit from Permit Authority or City Building Department having jurisdiction.
    b. The Permit Authority shall be responsible for inspection and approval of all electrical code requirements.
    c. Disconnecting means (control panel or disconnecting switch) shall be located in sight from the pump location per the County adopted electrical code.

2. The alarm shall be equipped with

    a. A loud (87 decibels at a 10 foot minimum horizontal distance from the alarm location) audio alarm operated by a float switch(s) to indicate an “alarm” situation.
    b. A minimum sized 7/8 inch diameter red light shall be mounted on the face of the panel, which shall glow as long as the “alarm” condition exists.
    c. A momentary “alarm test/alarm silence” switch to test the alarm light and horn to simulate an “alarm” condition and to silence the audio alarm horn.

3. An approved listed model or type of float switch shall be used to activate each pump. The alarm/control panel shall be equipped with a motor contactor for the pump and a pump hand/off/automatic switch to manually run the pump bypassing the control panel automatic mode and to test the alarm.

4. Power supply to each circuit breaker in the control panel shall be from a separate dedicated circuit with circuit protection, of equivalent or higher amperage rating, at the power supply panel.

    a. The alarm/control panel shall be equipped internally with separate circuit protection for the control and pump circuitry.

i. Multiplex (more than one pump) systems shall have separate power supply circuits.
ii. Separate circuits are required for controls and each pump.
iii. Joint circuits may be acceptable for existing sump/pump systems that were installed prior to this requirement if fused pursuant to the current Electrical Code.

b. Pump protection shall be provided by a thermal magnetic circuit breaker for overload protection.

i. If the pump is single-phase, the motor windings shall have internal thermal overload protection.
ii. If the pump is three-phase, the circuit protection in the alarm/control box shall be equipped with an adjustable thermal overload protection.

3. Below grade electrical splices shall be placed in a Sonoma County approved pull box installation or a Sonoma County approved external splice box with waterproof slice connectors.

i. Traffic-rated pull boxes shall be used in traffic and adjacent areas. See Figure 8.4b.

4. Electrical non-metallic splice boxes may be place within the sump chamber for existing sump/pump systems that were installed prior to this requirement. They shall be gas-tight boxes with waterproof splice connectors.

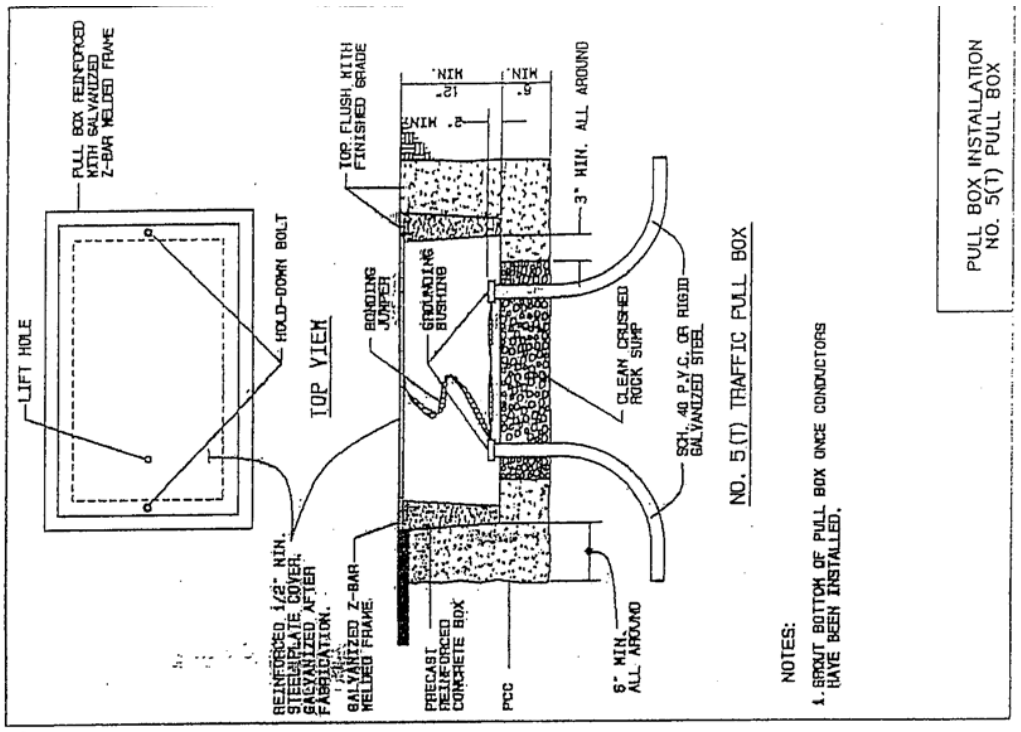
5. The pump power lead and the float switch control wires may run in a common conduit. High voltage and low voltage conductors shall be run in separate conduits.

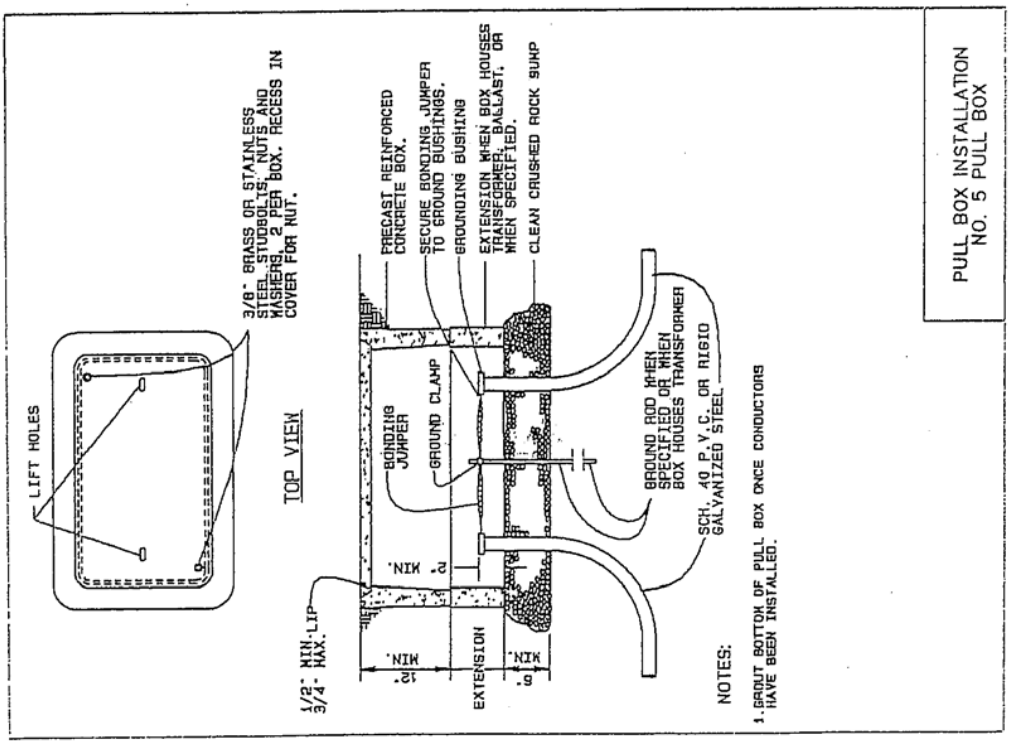
i. All cords going into the sump shall be individually sealed with non-metallic gas tight fittings in either the riser, junction box or alarm/control panel as appropriate.
ii. Metallic gas tight fittings are not allowed.
iii. All exposed PVC conduit shall be Schedule 80.

5. The control panel and its contents shall be UL listed.

a. The control panel shall be placed in an easily accessible location.
b. A non-resettable dose counter shall be installed in control boxes utilized for non- standard OWTS.
c. If a dose counter is not provided, a non-resettable flow meter shall be provided on the outgoing line to the dispersal field. Additionally, systems with flush modes shall be equipped with a flow meter on the return line. The flow meter shall read in gallons per minute and total gallons.
d. The control panel shall be equipped so settings can be adjusted manually on-site.
e. Control boxes that must be opened to view the dose counter shall be equipped with a clear plastic or Pyrex safety shield inside the control box.
f. The control box shall be labeled “Caution-Electrical Hazard.”
g. The dose settings (time or gallons), calculated dose volume and float settings shall be posted on the inside of the panel.

Figure 8.4b Sump and Pump Requirements





6. All exterior mounted alarm and controller enclosure shall be NEMA Type 4. If the alarm/controller is mounted more than 75 feet from any residence or commercial structure served by the system, a separate audible/visible alarm shall be provided at the primary structure connected to the OWTS.

    a. The enclosure for the remote and audio/visual alarm shall be NEMA Type 1 if mounted indoors.

E. Required features of sewage piping are as follows

1. The effluent line entering the sump shall be minimum three (3) inch diameter ABS Sch 40 or PVC Sch 40, and shall be sealed with a coupling integrally cast into the tank, a properly fit neoprene grommet or with non-shrink grout as appropriate.

    a. The effluent line shall be turned down with a sanitary tee fitting and drop that extend to within four (4) inches of the tank floor.

2. Minimum 1 inch PVC Schedule 40 from pump to dispersal field is required with

    a. A 1/8 inch diameter anti-siphon and air vent hole located between the pump and check valve angled down and away from the floats,
    b. PVC check valve,
    c. PVC gate or ball valve and union(s).

3. Brass type fittings, valves, and piping are prohibited in sump chambers.

4. High points in the transmission line after the sump may require an “air relief valve” depending on the design situation.

8.5 Alternating Leach Fields

A. Alternating leach fields are required for OWTS of greater than 500 lineal feet of leach line.

B. An approved diversion valve or dosing tank with pump(s), are required for alternating leach fields.

C. Each primary field shall be equal to 75% of the primary leach field lineal requirement.

D. For installations of from 500 to 1000 lineal feet of leach line, the dosing requirement may be satisfied by any one of the following approaches.

1. Dosing tank with a pump which discharges the tank once every 3 or 4 hours.

2. Alternating leach fields with an approved diversion valve.

3. Two (2) or more septic tank / leach field systems, with neither system exceeding 500 lineal feet of leach line.

E. For installations of greater than 1000 lineal feet of leach line, the dosing requirement may be satisfied by any of the following approaches

1. Dosing tank with two (2) pumps dosing alternately and each serving one half (½) of the leach field.

2. Three (3) or more septic tank/leach field systems, with no system exceeding 500 lineal feet.

8.6 Intercept Drains

A. The design of the intercept drain is dependent on the size of the contributing drainage area, the amount of water that must be removed, the soil's hydraulic properties, and the available slope of the site. The use of intercept drains to lower the level of perched groundwater in the immediate dispersal field area shall be acceptable only under the following conditions:

1. The design plan shall signed and stamped by a Qualified Consultant.

2. Natural ground slope is greater than five (5) percent;

3. Site investigations indicate groundwater to be perched on bedrock, hardpan, or an impermeable soil layer;

4. The intercept drain extends from ground surface into bedrock, hardpan, or impermeable soil layer.

5. A trench width of a minimum of one (1) foot.

6. The upslope side of the trench shall be lined with a geotextile filter fabric.

7. The down slope side of the trench shall be lined with 10 - 12mm polyethylene sheeting.

8. The drain rock shall be 3/4 inch to 2 inch diameter in size and washed, contain less than one percent fines (sand, very fine silt, and clay) and extend from trench bottom to within 6 to 12 inches of grade and backfilled to grade with native soil.

9. The collection pipe shall consist of 4 inch diameter perforated drain pipe, oriented with holes down and installed on top of the drain rock, approximately 2 to 4 inches above trench bottom.

10. The outlet pipe shall consist of a minimum 4 inch solid (non-perforated) drain pipe at the point of discharge with placement of rip rap and be maintained free and clear.

11. The trench and pipe shall be sloped for gravity flow at a minimum 1% gradient throughout the trench and extending to the outlet point.

12. Cleanouts to grade are required

    a. At the upslope end of the drain;
    b. At bends of 45 degrees or greater;
    c. At least every 100 feet along the length of the drain.

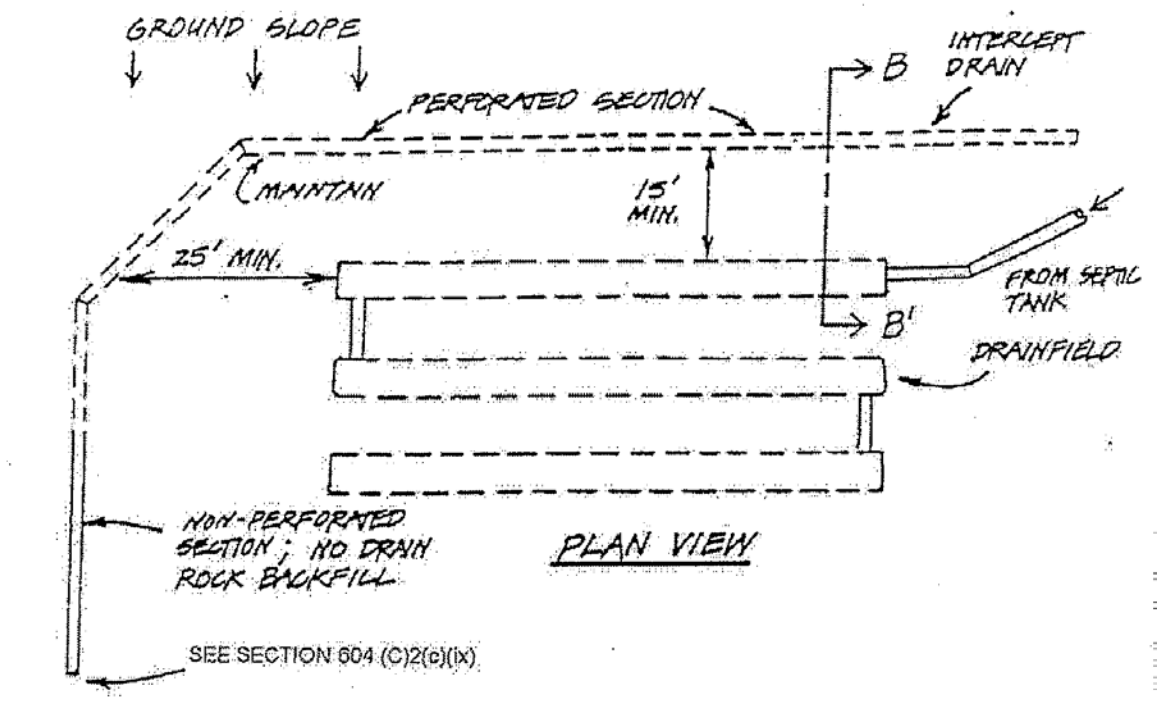
B. The perforated section of an intercept drain shall not be located less than 15 feet upgradient nor 25 feet laterally or 25 feet downgradient of a septic tank. The perforated section of an intercept drain shall not be located less than 15 feet upgradient nor 50 feet laterally or 50 feet downgradient of a dispersal area or non-standard system.

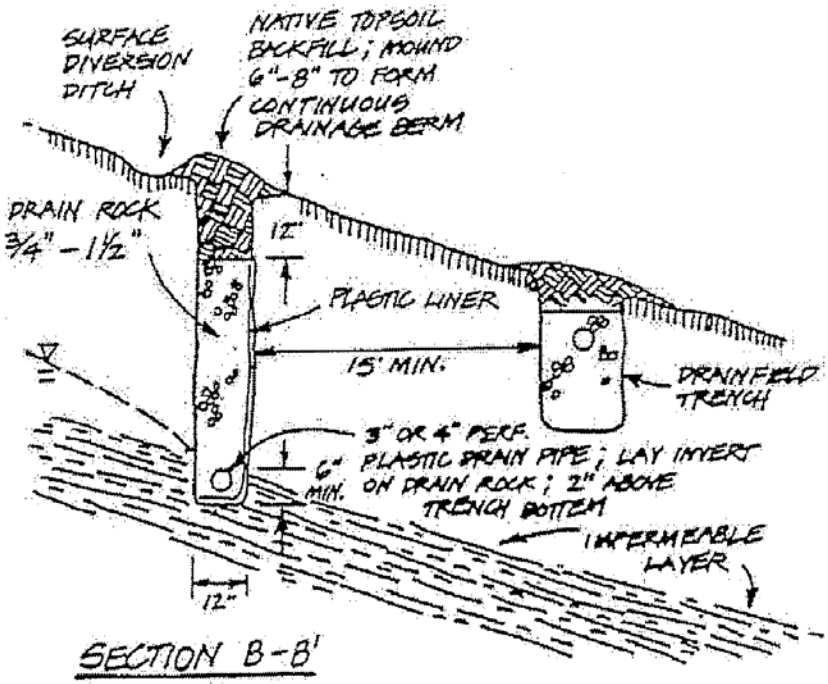
C. The non-perforated or solid section of a drain pipe shall not be located less than 5 feet upgradient nor 10 feet laterally or 10 feet downgradient of a septic tank. The non-perforated section or solid section of drain pipe shall not be located less than 10 feet upgradient nor 15 feet laterally or 15 feet downgradient of a dispersal area or non-standard system.

D. Where all of the above conditions cannot be met, actual performance of the intercept drain shall be demonstrated prior to approval for an OWTS permit.

E. Interceptor drains are required and shall be installed according to Section 18A.b and c (West Petaluma Variance Prohibition Special Standards Area).

Figure 8.6 Interceptor Drain





TYPICAL INTERCEPT TRENCH DETAILS

8.7 Stream and Driveway Crossings

A. All pipe used within the watercourse setbacks or under a driveway must be PVC Schedule 40 or other approved material.

B. All effluent transmission pipes used for stream crossings must be pressure tested at the time of installation and prior to final inspection. Pressure testing shall be conducted in accordance with the most current version of the Sonoma County Water System Standards Including Standard Drawings, section 8, Inspection and Testing,

   1. Buried pipe must have a minimum of four (4) feet of cover over the portion of the pipe under the center line of the stream.

      a. This may be reduced to one (1) foot if the portion of the pipe under the stream banks is encased (sleeved) in ABS Schedule 40, PVC, cast iron, or concrete pipe extending a minimum of 25 feet beyond the high water elevation mark on both sides of the stream.

   2. Pipe must be encased (sleeved) with cast iron or well casing whenever it is exposed or above the stream.

      a. Pipe must be one foot above the 100 year flood elevation.
      b. Pipe must be either covered with fill over a culvert or hung by approved hangers every four (4) feet from an appropriate supporting structure as specified in the California Plumbing Code.

C. All effluent transmission pipes used for driveway crossings must have a minimum of one (1) foot of native cover over the pipe and encased (sleeved) with ABS Schedule 40, PVC, cast iron, or concrete pipe extending a minimum of five (5) feet beyond the driveway edges.

Section 9 Criteria for Standard OWTS

9.1 Standard OWTS

A. A standard OWTS consists of an approved septic tank and standard dispersal trenches. A standard OWTS may include a pump system to enable the installation of a dispersal field up- slope of the structure to be served.

B. Standard OWTS may be allowed in areas with a soil percolation rate of 60 minutes per inch (mpi) or less. Soil percolation rates of 61mpi to 120 mpi require installation of a non-standard OWTS.

C. The minimum soil depth below the leaching trench shall be three (3) feet for a Standard OWTS.

D. Standard OWTS may not be installed on slopes exceeding 30%.

E. Sizing of standard OWTS shall be based on Table 7.2a Sewage Application/Soil Loading Rates (gal/sf/day) at 150 gal/bedroom. Lineal footage sizing requirement is based on the consideration of sidewall area only. Credit is not given for trench bottom area. Note: 20% reduction allowed with installation of low flow fixtures.

F. The required lineal feet of standard leach line is determined by the Design Flow Rate divided by the Soil Loading Rate (Table 7.2a) divided by the trench lineal area available (sidewall infiltration only, bottom area is not included). For example a 2 bedroom house at 150 gpd/bedroom = 300 gpd. A percolation rate of 30 mpi = 0.56 gal/sf/day. 12 inches of gravel below the pipe x 2 =2sf per lf. Thus 300/0.56/2 = 268 linear feet required.

9.2 Standard Dispersal Trench

A. Dispersal trenches shall be installed on contour. Dispersal trenches shall be placed a minimum of eight (8) feet on center on slopes up to 30%.

B. The depth of the dispersal trenches, dependent on the slope, percolation depth, or type of standard OWTS is found in Table 7.8a.

C. The dispersal trenches shall be constructed in maximum lengths of 100 feet and at widths between 18 inches to 24 inches. The bottom of the dispersal trench shall be level to within a tolerance of three (3) inches in 100 feet.

D. Dispersal trenches shall contain double-washed rock filter material of 3/4 to 2 ½ inches in diameter, perforated sewage distribution pipe, geotextile filter

fabric, and back-filled with a minimum of 12 inches of soil.

E. The PRMD may permit gravel-less trench construction. The design, manufacturing and materials shall be durable and approved by the PRMD (See Section 9.4).

F. A concrete or plastic distribution box shall precede each dispersal trench for the receipt and distribution of wastewater into the trenches. There shall be a minimum distance of four (4) feet between the distribution box and the dispersal trench.

G. Distribution boxes shall be placed for serial distribution of wastewater on sloping ground.

H. Distribution boxes shall be placed for equal distribution of wastewater on flat terrain.

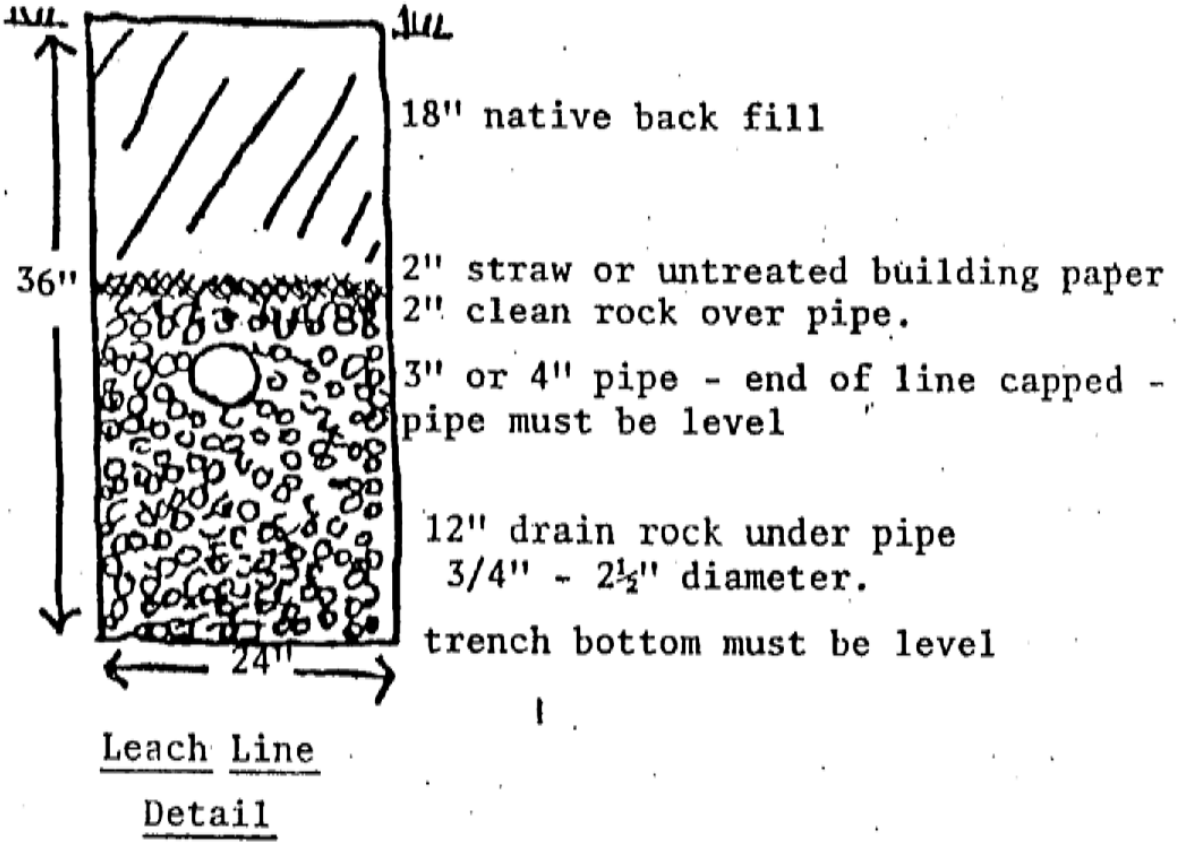
I. The distribution box shall be placed in native soils at the appropriate depth. A minimum of twelve (12) inches of backfill shall be placed above the distribution box or extended to grade with a riser. The distribution box shall not be placed in over-excavated soils.

J. Metal detection markings, a 2 foot x ½ inch galvanized pipe or rebar shall be installed flush and vertical at each distribution box and in a vertical position against the trench wall at the end of the leach line, and also in the middle of lines that are longer than 50 feet. The pipe or rebar shall not be placed at a depth greater than 24 inches.

K. Construction and paving over leaching systems and replacement areas is prohibited

L. Refer to Figure 9.2 Standard dispersal trench detail.

Figure 9.2 Standard Leachline Trench



Note: Depth of trench dependent on slope and/or depth of rock below pipe. 30" deep system with 12" of drain rock under the pipe requires 12" of native backfill. Allowable width of standard leachline trench 18 - 24"

9.3 Seepage Pits

A. Seepage Pits may be allowed under the following conditions:

1. Separation of the bottom of seepage pits to groundwater shall not be less than 10 feet.

2. Seepage pits shall be no deeper than 6 feet.

3. Seepage pits can only be installed if a satisfactory dispersal trench installation cannot be installed.

4. It is recommended that seepage pits be at least the same size (gallonage capacity) as the septic tank size that would be required based upon the number of bedrooms in the dwelling.

5. All seepage pits shall be completely filled with drain rock. No redwood seepage boxes will be permitted.

9.4 General System Installation Requirements

A. OWTS shall be installed in accordance with the plans approved by the PRMD. The PRMD staff must approve any changes in the installation plan prior to installation.

B. OWTS shall be located so as to be accessible for maintenance and repairs. Septic tanks and sump tanks shall be located so as to allow vacuum pumping.

C. The building sewer and distribution piping shall be constructed with materials in conformance to building sewer standards identified in the Uniform Plumbing Code. The sewer and distribution piping shall have approved watertight fittings with clean-outs provided in accordance with the Uniform Plumbing Code. Piping shall be ABS or PVC Schedule 40 or better.

D. Dosing siphons are prohibited.

E. Leaching area side-walls should be left with rough surfaces prior to backfill.

F. Construction of OWTS shall be avoided during the rainy season. Dispersal trenches are to be back-filled as soon after final construction inspection as possible. Trenches that have remained uncovered during any substantial rain may require abandonment or entire retrenching.

9.5 Gravel-less Drain field Systems

A. Gravel-less drain field systems replace conventional rock and pipe standard OWTS drain fields.

B. Gravel-less chambers are typically made of recycled plastic and must be pre-approved by PRMD.

   1. Chambers are usually installed in an 18 or 24 inch wide trench.

   2. The chambers are interlocking arches that form a continuous drainage area with louvers to allow dispersal of the effluent into the soil.

   3. Sizing of the OWTS dispersal field is based on the height of the louvers sidewall infiltration area only. No credit is given for the trench bottom area. For example, if the chambers have louvers to a height of 9.5 inches, an infiltrative area of 1.6 square feet per linear foot is available.

      a. Any other configuration must be reviewed on a case by case basis.

C. Cylindrical bundles typically consist of a geosynthetic aggregate held in place with a high density polyethylene netting, with or without a 4 inch polyethylene pipe, and must be pre- approved by PRMD.

   1. Bundles are usually installed in an 18 or 24 inch wide trench.

   2. The bundles, also referred to as cylinders, are typically 12 or 18 inches in diameter

   3. Sizing of the OWTS dispersal field is based on the sidewall area beneath the invert, the number and the configuration of the bundles placed in the trench. No credit is given for the trench bottom area. For example, a bundle with a diameter of 12 inches containing the pipe, installed in a square configuration with 3 additional bundles with out pipe, installed in a 24” trench, provide an infiltrative area of 3.0 square feet per linear foot.

      a. Any other configuration must be reviewed on a case by case basis.

D. Where soil and site conditions allow, approved chamber and cylindrical bundle systems may be installed in lieu of conventional gravel trench at depths up to 60-inches, as measured from the base of the trench to ground surface.

E. Minimum 12 inches of soil cover is required over the cylindrical bundle(s) or chambers.

F. Trench spacing, prevention of soil infiltration from cover soil, and all other

requirements are the same as for gravel trenches.

G. The chamber and cylindrical bundle systems are not to be installed in locations that would be subject to vehicular traffic, such as driveways or parking areas.

9.6 Filled Land Systems

A. Filled Land OWTS are systems where imported soil is imported and compacted to a minimum depth of 12 inches over native soil for the dispersal trench area of the system.

1. The system must be designed by a qualified consultant.

2. Filled Land proposals for subdivisions which have received tentative map approval based on the prior filled land septic system policy dated 01/01/09 shall not be deemed acceptable for processing of the septic requirements for the subdivision.

3. All the test holes in the area proposed for the Filled Land system and the reserve replacement area and within a 20 foot radius of the proposed perimeter of the leach field shall be evaluated per standard system percolation test criteria. See Table 9.5 for allowable trench depth into native soil.

Table 9.5 Filled Land OWTS Trench and Fill Requirements

Trench Depth Into Native (inches)	**Gravel Depth Below Pipe** (inches)	**Fill Material Needed** (inches)
12	9	15
15	12	15
18	12	12
18	15	15
21	18	15
21	12	9
24	21	15
24	18	12
24	12	6
27	24	15
27	18	9
27	12	6
30	24	12
30	18	6
30	12	No Fill. Standard System

4. A full description of the complete installation including quality, kind and grade of all materials, equipment, construction workmanship and methods of assembly and installation shall be provided.

5. Proof of soil below the bottom of the trench is the same as for standard systems and can be demonstrated by percolation testing, soil morphology, and texture analysis. At a minimum, 3 feet of continuous acceptable soil is required below the proposed trench bottom. A variance for an alternative system (i.e. incorporation of an approved pretreatment unit) may justify reduction of the setback to 2 feet below trench bottom.

6. Filled Land Systems are limited to areas not exceeding 25% slope.

7. All dispersal trenches shall be a minimum of 12 inches in depth into native soil.

8. Gravel depth above pipe is to be 2-3 inches.

9. Gravel depth below pipe is to be not less than 12 inches unless an administrative variance is approved. See Table 9.5 for permissible gravel depth below pipe.

10. Trench width of 18-24 inches

11. Increased trench depth and gravel depth is permissible with a subsequent reduction of fill soil. A minimum of 6 inches of fill for any trench depth is required. A minimum of 15 inches of soil is always required above the pipe. See Table.9.5 for fill material requirements.

12. Use of gravel-less drainfield systems, as described in Section 9.4, are permitted.

13. The absorptive quality of imported soil for the leach field cover shall be equal to or better than the native soil meeting percolation test requirements. Sand, gravel, rock or compost does not qualify as acceptable cover material for filled land systems.

14. Cover material for filled land systems shall be constructed in not more than 8 inch layers to approximately the same relative compaction as the upper soil horizon native to the site. Certified results of the soil density test may be required to be submitted to the Well and Septic Section by the Registered Civil Engineer or Environmental Health Specialist.

    a. The fill is to be of uniform depth extending to a distance at least 15 feet from the center of any trench in all directions except the up slope distance may be reduced to 5 feet with additional fill to maintain a 5:1 taper for a total of 10 feet from the center of the up slope dispersal trench on slopes above 5%.
    b. The down and side slope toes of the fill should be tapered at a 5:1 ratio beginning 15 feet from any leach field or proposed leach field expansion

area to provide a total of 20 feet from the center of any trench.

15. Reserve replacement areas must be demonstrated as per other standard systems. A 100% reserve replacement area for pre October 1971 parcels and 200% for post October 1971 parcels is required. Fill material is not required to be placed on the reserve placement area prior to permitting of the replacement system.

16. Site specifications for fill shall indicate that vegetation is to be removed and surface prepared to permit good mixing of the native soil and fill material added.

    a. Areas with closely-spaced trees in excess of 24 inches in diameter are generally not suitable for filled-land systems.
    b. Roto-tilling to prepare the site for fill is prohibited. A single pass 6 inch rip of the surface soil to ensure a good mixing of the native soil and the fill material is required. c. Wheeled tractors are to be minimized in the dispersal area at this time to avoid soil compaction.

17. Specifications on Filled Land proposals require the fill to be completed before any leaching trenches are constructed.

18. Construction of any dispersal field should be avoided during the rainy season. Lines are to be back-filled as soon after final construction inspection as possible. Lines which have remained uncovered during any substantial rain may require abandonment or entire retrenching. The fill area shall be seeded or sodded with appropriate vegetation after construction of the dispersal field is complete. Appropriate erosion control measures shall also be in place.

9.7 Shallow Sloping OWTS

A. The determination of site suitability for a “shallow sloping OWTS”, a standard OWTS that may be installed where depth of permeable soil is inadequate to provide for 15 foot to breakout from the leach pipe to the surface of a slope in areas with slopes from 12.5 to 30%, may be considered provided the following conditions are met

    1. The system must be designed by a qualified consultant.

    2. If one or more soil profiles performed on the site at the depths required for 15 foot-to breakout prove unsatisfactory and are supported by soils profiles, then additional tests to justify a “shallow sloping system” may be considered.

    3. Eight (8) or more percolation test holes (in no instance less than 36” in depth)

are required:

1) at least 6 in the primary/replacement area,
2) one hole 25 feet downslope and
3) one hole 50 feet downslope of the lowest leach line in the primary/replacement area to show the permeable top soil is continuous (i.e. adequate distance and depth of soil exists to provide filtration and treatment of effluent).

4. Percolation rates of 1 to 60 mpi are required.

   a. Percolation rates of faster than 5 minutes/inch may require additional evidence that breakout of effluent to the surface or contamination of beneficial waters will not occur.

5. The percolation test report must evaluate slope stability. Proposed leach field areas which are identified on geologic maps of Sonoma County as unstable or questionable must be surveyed by a Registered Geologist. Any mitigations recommended by the geologist are to be incorporated into the system design.

6. Any proposed leach field area with outcroppings of bedrock or impermeable soil horizons is not acceptable for a “shallow sloping system”.

B. The design criteria for a “shallow sloping OWTS” includes the following

1. Any “shallow sloping OWTS” proposed under these criteria shall be designed by a Qualified Consultant.

2. Dispersal fields are to be set back a minimum of 50' from any bank, natural or manmade, unless otherwise specified by Table 7.2b or where more stringent requirements may apply.

3. Leach fields and reserve replacement areas shall be placed so as to utilize as much of the upper contours of the site as possible. Serial distribution is required unless an approved parallel distribution system is developed.

4. Trenches must be at least 18" wide and a minimum of 36" deep. Construct dispersal trenches with 12" gravel under the pipe, 2" gravel over the pipe, and 18" of earth backfill. If there is more than 36" of soil as shown by percolation tests and more than 12" of gravel can be used, credit for use of additional trench sidewall may be granted. Non-residential designs will be based on PRMD, EPA, or other approved design criteria.

5. Space trenches at least 10' on center (8' solid earth between trench walls).

6. Amount of leaching trench required for each primary field will be determined from the number of bedrooms and approved percolation

rate.

a. Construct two primary leach fields divided by an approved diversion valve which can be alternated on at least a yearly basis.
b. Each primary field shall be equal to 100% of the pre-determined lineal requirement.

7. All dispersal fields are to be provided with an intercept drain unless no significant watershed exists above the system.

a. Exceptions must be justified by satisfactory wet-weather ground water determinations.
b. Intercept drains shall be installed according Section 8.6.
c. Drainage diversions shall not influence neighboring properties.
d. All surface drainage shall be diverted away from the leach field area.
e. All perforated portion of intercept drains must be a minimum of 25' from any property line unless a variance is justified.

C. The following additional requirements apply to “shallow sloping OWTS”

1. Construction of the dispersal field should be during the dry portion of the typical Sonoma County year. The rainy season should be avoided. Lines are to be back-filled as soon after final construction inspection as possible. Lines which have remained uncovered during any substantial rain may require abandonment or entire retrenching.

2. Benching is not permitted during construction of the dispersal field.

3. The area of the leach field should be stabilized by sodding or seeding with native grasses to control erosion.

4. No animals may be contained, housed, or pastured over the dispersal field. The soil in the dispersal field area shall not be disturbed by cultivation or tilling.

5. If any lot is to be created utilizing a “shallow sloping system” design, appropriate deed restrictions shall be recorded prior to validation of the land division.

9.8 Standard Shallow Trench Pressure Distribution (STPD) OWTS

A. If desired by the property owner, a STPD OWTS may be permitted as a Standard OWTS, rather than a Non-Standard OWTS, under the following conditions

1. The percolation rate is 60 mpi or less at proposed trench bottom and otherwise meets the Section 7 Site Evaluation and Investigation Requirements.

2. Gravel size of ¾" to 2 ½ "is allowed.

3. Except for the percolation test rate of 60 mpi or faster and gravel size, the proposed OWTS otherwise meets all other Section 13.3 STPD site, design and construction criteria.

4. A STPD that meets the above referenced requirements shall not be subject to the Section 13 Non-Standard OWTS Operational Permit and Monitoring Reporting Requirements.

Section 10 Criteria for Water Reuse

10.1 Graywater

A. The construction, alteration, and repair of gray water systems are subject to the provisions of the 2013 California Plumbing Code (CPC), Chapter 16 Alternate Water Sources for Nonpotable Applications, Section 16.02.

1. A Clothes Washer System is subject to the requirements of the 2013 CPC Section 16.02.1.1.

    a. The repair, alteration, relocation, installation or construction of a clothes washer graywater system is exempt from a permit unless it is demonstrated that the system does not meet the requirements of the 2013 CPC Section 16.02.

2. A Simple System is subject to the requirements of the 2013 CPC, Section 16.02.1.2.

    a. An application for a permit, accompanied by fees as specified in the current fee resolution, is required for a Simple System.

3. A Complex System is subject to the requirements of the 2013 CPC Section 16.02.1.3.

    a. An application for a permit, accompanied by fees as specified in the current fee resolution, is required for a Complex System.

Section 11 Criteria for Commercial, Industrial, Institutional OWTS

11.1 Commercial, Industrial, Institutional OWTS

A. All commercial OWTS shall be designed by a Qualified Consultant.

B. A typical commercial OWTS would service businesses such as, but not limited to food facilities, schools, care homes, childcare facilities, dog kennels, veterinary offices, wineries and wine-tasting rooms. Refer to Table 11.1.

C. All commercial OWTS, including, pre-1971 created parcels shall provide 200% reserve replacement area. Dual dispersal fields consisting of a primary field and a secondary field (75% of design flow) with a diversion valve to alternate the field use are recommended but not required.

D. Commercial OWTS that exceed the 1,500 gpd flow criteria of this section are subject to Section 14 Operational Permit and Monitoring Requirements or Section 11.5 Package Treatment Plant Permit requirements.

E. For commercial uses, the minimum size of the septic tank must be based on the formula V (net volume in gallons) = 1,125 + 0.75Q (daily wastewater flow in gallons)

F. Pretreatment is required when high strength commercial wastewater is proposed. Pretreatment components and/or pretreatment system shall reduce wastewater strength to levels below the defined levels for high strength wastewater.

G. Any OWTS that receives high strength wastewater from a commercial food service building requires a properly sized and functioning oil/grease interceptor.

Table 11.1
Multiunit and Non-Residential Design Flow Rates

TYPE OF OCCUPANCY	GALLONS PER DAY
Airports	5 per passenger
Campgrounds:	
Campground with central comfort station	35 per person
Campground with flush toilet, no showers	25 per person
Day Camps (no meals)	15 per person
Luxury Camp, private bath	100 per person
Summer and seasonal	50 per person
Churches (sanctuary)	5 per seat
With kitchen wastes	7 per seat
Country Club	125 per person
Factories	35 per person per shift
Hospitals	250 per bed space
Kitchen waste only	25 per bed
Laundry waste only	40 per bed
Hotels/Motels with private bathroom (no kitchen waste)	60 per two person room
Hotels/Motels without private bathroom (no kitchen waste)	50 per two person room
Hotel/Motel with private bath and kitchen	75 gallons per person
Institutions other than hospitals	125 per bed space
Movie Theaters	5 per seat
Offices	20 per employee
Picnic parks with toilets and showers	10 per person
Picnic parks with toilet waste only	5 per person
Resort camps with limited plumbing	50 gallons per person
Restaurants:	
Kitchen waste (multi-use utensils)	5 per meal served
Kitchen waste (disposable utensils)	3 per meal served
And add the following for type of facility present:	
Conventional sit down	10 per person
Short Order	8 per person
Bar and Cocktail	3 per person
School (non-boarding	20 per student
With gym and showers add	5 per student
With cafeteria using disposable utensils	3 per meal served
Self service laundries	50 gallons per wash
Service station	10 gallons per vehicle served
Retail stores	20 per employee
For public restrooms add	1 per 10 square feet
Swimming pools and bathhouses	10 per person
Tourist camps or mobile home parks with individual bath units	100 per person
Tourist camps or trailer parks with central bathhouse	75 per person
Work or construction camps (semi-permanent)	50 per person
Wine tasting facility (no meals served)	3 per person
Employee	15 per employee

11.2 Winery OWTS

A. The peak daily flows from wineries shall be determined by either the tons of grapes processed or cases of wine produced annually. The following shall be used in the determination of peak daily flows:

1 case of wine	=	2.4 gallons
1 ton of grapes	=	160 gallons of wine

Peak wastewater flow=1.5 gallons for each gallon of wine

Production
Length of crush season varies by winery production –see formulas below The

following formulas are used to calculate winery wastewater flows

WINERY SIZE	**FORMULA**
Up to 20,000 gallons per year	$\frac{\text{Annual production (gal) x1.5}}{\text{30 day harvest period}}$
20,000-50,000 gallons per year	$\frac{\text{Annual production (gal) x1.5}}{\text{45 day harvest period}}$
50,000 gallons per year and above	$\frac{\text{Annual production (gal) x1.5}}{\text{60 day harvest period}}$

B. Winery process wastewater and domestic sewage shall have separate tanks.

1. Domestic and process wastewater may share a common leachfield.

C. Mounds are prohibited for winery wastewater dispersal systems unless supplemental treatment is provided to reduce BOD to <300mg/L.

D. A minimum three (3) day hydraulic retention time for peak winery process wastewater flow is required.

E. Pretreatment must be provided to treat the winery process wastewater to domestic wastewater levels (<300 BOD and TSS) for discharge to an approved OWTS.

F. Coverage under waste discharge requirements or waiver therefore, from the appropriate Regional Water Board, shall be required prior to issuing a septic permit.

11.3 Special/Cultural Events

A. The intent of this standard is to provide sizing criteria for onsite dispersal systems that are commensurate with the number and size of special events approved under the facility's permit. Generally, this standard requires larger dispersal systems as the number and size of permitted events increases.

B. For purposes of implementation of Special Events granted in Use Permits and the use of Portable Toilets. The following definitions apply:

1. "Event" means any special event authorized under a Use Permit or an "Occasional Cultural Event" as defined in the zoning ordinance and as interpreted by the Board of Zoning Adjustments. "Event" includes industry-wide events.
2. "Visitors per day" means the peak number of visitors estimated for the entire busiest single day of one event, and not the combined number of visitors of both days of a week-end event, and not just the maximum number of visitors at one time during the busiest day.

Table 11.3 Special Events and OWTS Sizing Criteria

Number of special events approved per year.	**Percent increase in the design and capacity of the facilities waste water treatment system due to special event waste water flows.***
0 to 4	The additional special event waste water flow may be accommodated by portable toilets. No increase in the facility waste water system required.
5 to 10	The design and capacity of the facilities waste water treatment system must be increased by 25% of the fifth largest single special event flow.
11 to 25	The design and capacity of the facilities waste water treatment system must be increased by 50% of the fifth largest single special event flow.

26 or more	The design and capacity of the facilities waste water treatment system must be increased by 100% of the fifth largest single special event flow.

C. The wastewater system consultant shall justify the sizing of the OWTS for Special Events based upon the specific circumstances of the site and the proposed event

1. Special Events without food service shall size the on-site wastewater dispersal system as large as needed, but in no case at less than two and one half (2 and 1/2) gallons per visitor per day.

2. Special events with food service shall size the on-site wastewater dispersal system as large as needed, but in no case at less than five (5) gallons per visitor per day.

D. Sizing of the OWTS for Special Event wastewater flows shall comply with the following requirements when mitigation is provided by an adequate number of portable toilets as specified in PRMD Policy and Procedure 9-2-31 Sizing of Onsite Wastewater Dispersal Systems for Special Events Authorized by Use Permits and the Use of Portable Toilets (Appendix D) and Table 11.3. The Special Event Waste Water Flow is the additional sewage flow expected from the largest single special event that is in excess of the normal waste water flow from the facility.

11.4 Flow Equalization

A. Flow equalization is the process of controlling the rate of wastewater flow through an OWTS by providing surge capacity storage and timed-dosing of the incoming flow. Installed following the septic tank, it allows peak surges in wastewater flow (e.g., from a weekend event) to be temporarily stored and metered into the treatment system and/or dispersal field at a relatively even (“average”) rate over an extended number of days (e.g., during the subsequent week). This generally aids OWTS performance.

B. Where flow equalization is proposed to be incorporated in an OWTS the following apply:

1. The septic tank capacity shall be sized based on the peak daily flow for the facility;

2. The design flow used for sizing supplemental treatment unit(s) and/or the dispersal field may be based on the equalized (“average”) flow rate rather than the peak daily flow rate for the facility;

3. Engineering calculations and specifications must be submitted substantiating the proposed design and operation of the flow equalization system; and

4. An operating permit (per Section 14) will be required.

C. Flow equalization may be used for non-residential and mixed use facilities that experience significant, regular and predictable fluctuations in wastewater flows. Examples of applicable facilities include, but are not limited to:

1. Churches
2. Schools
3. Special/Cultural event venues

11.5 Package Treatment Plants

A. Package Treatment Plants include systems that use wastewater in a manner subject to Title 22 wastewater reclamation standards and/or any treatment unit other than a septic tank which processes more than 10,000 gallons of wastewater per day. It does not include systems which process wastewater originating solely from agricultural uses, retail food facilities or storm water if these systems do not include any domestic wastewater component.

1. Package treatment plants cannot serve multiple uses on separate parcels under separate ownership unless the Board of Supervisors approves specific findings for multiple ownership of sewage dispersal systems.

B. The application request for a package treatment plant must be prepared by a Registered Civil Engineer with documented experience in the design of sewage treatment plants and must include the following:

1. A full description of the proposed collection and treatment method and process components.

2. A full description of the proposed method for wastewater dispersal.

3. Environmental review for CEQA compliance.

C. The typical conditions of approval for a Package Treatment Plant include the following:

1. An independent engineering consultant acceptable to PRMD shall perform peer review of the plans at the applicant's expense.

2. A permit to construct the collection system shall be obtained from PRMD prior to the start of any construction of the collection system.

3. All applicable county permits shall be obtained for the treatment and dispersal facilities including grading, electrical, and plumbing permits.

4. Prior to obtaining building permits for any portion of the project, Waste Discharge Requirements shall be obtained from the appropriate Regional Water Quality Control Board.

5. The long term managerial and financial needs of the package treatment plant shall be fully documented.

    a. Prior to the issuance of building permits, deed restrictions shall be recorded specifying the conditions under which the package treatment plant was approved.

6. The package treatment plant shall be operated under a valid Sonoma County Operational Permit in accordance with an approved monitoring plan.

7. Use of the facility shall cease if either the Waste Discharge Requirements or the County Operational Permit is revoked.

D. For additional information and specific requirements refer to Appendix D PRMD Policy and Procedure 1-4-3 *Package Treatment Plant Policy and Procedure.*

11.6 Performance Wells

A. All commercial systems and nonstandard OWTS must be designed with a series of performance wells to monitor the performance of the system. In limited circumstances, performance wells may be required for standard OWTS that may present a threat to public health and/or the environment. Sampling of effluent in the wells may be required to evaluate the treatment of the system and ensure that groundwater degradation does not occur.

B. The construction of the performance wells shall be constructed with 3” or 4" approved casing and screened with 1/16" or 3/32" slots, and a minimum 12 inch annular concrete seal. Monterey sand or equivalent shall be placed from the bottom of the well to the depth of the annular seal. The exception to the Monterey sand fill is for the wells in the gravel bed of at- grade or mound systems. These wells shall be filled from the bottom of the well to the depth of the annular seal with pea gravel.

C. All performance wells are designed to monitor the performance of the system by sampling groundwater to ensure degradation does not occur. Performance wells are strategically placed up-gradient, within, laterally, and down-gradient of the OWTS.

1. If damage is noted during monitoring or the performance well cannot be located, the well shall be replaced by a qualified contractor in the area shown on the original design.

D. The performance wells shall be either augured or post holed or drilled by hand after the OWTS is completed. The construction of the performance wells shall be as mandated by the PRMD staff. The soil shall be scarified to remove compaction or smeared soil that may seal the performance well. A backhoe shall not be utilized to excavate for a performance well.

E. Performance well heads shall be protected and encased within plastic, concrete, or an approved type box to provide easy access.

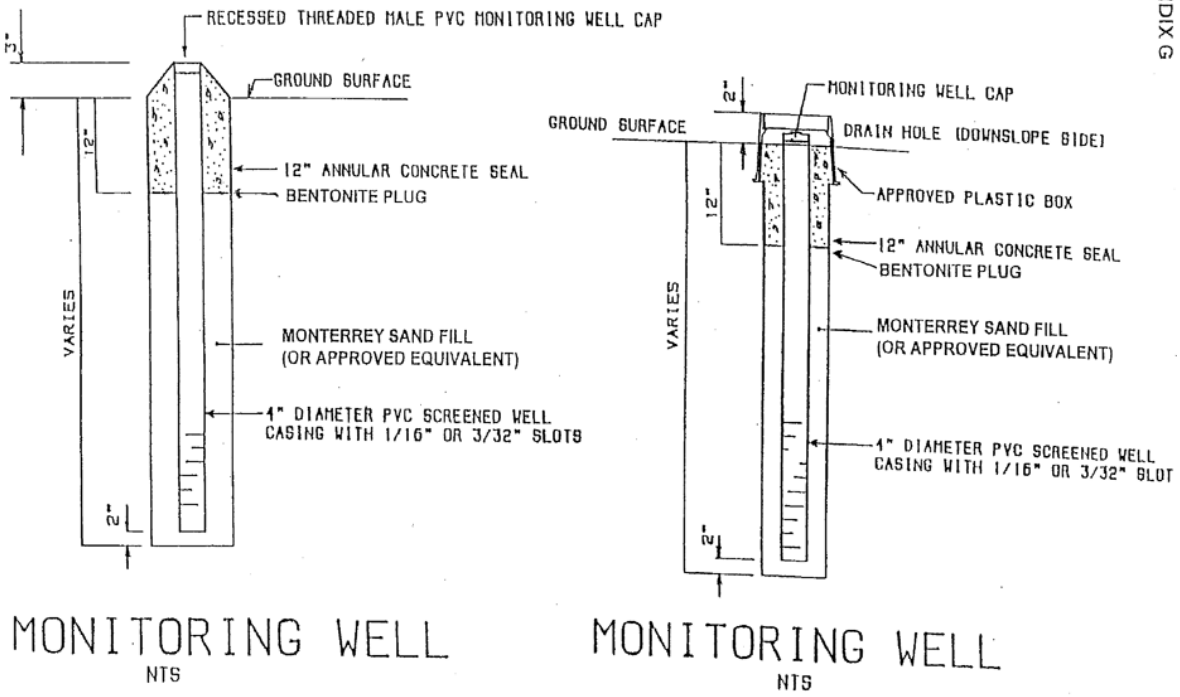
1. The performance well caps/lids shall be maintained for easy removal/access during monitoring and need to prevent surface water from entering the well.

F. The depth of the annular seal for the performance wells within the gravel bed shall not exceed beyond the depth of the gravel bed of the OWTS.

G. A concrete annular seal of a minimum 12 inches from the surface of native grade is required for all performance wells, between the earthen side-wall and the solid portion of the performance well pipe.

H. Refer to Sections 11, 12, 13 and Figure 11.6 for additional performance well information and specific requirements.

Figure 11.6 Performance Well Detail



11.7 Grease Interceptors

A. Grease interceptors are required when greater than 50 mg/l of grease is introduced into a commercial OWTS.

1. Plans and specifications for grease interceptors shall be submitted to PRMD for approval. The PRMD staff shall review the grease interceptor design in accordance with minimum design and construction criteria established by Sonoma County.

2. Waste from floor drains, floor sinks, dishwashers, pot sinks, and mop sinks shall be plumbed separately into the grease interceptor.

3. Effluent from grease interceptors shall be disposed of in a septic tank and not directly discharged to the dispersal field.

4. Grease interceptors shall be located, installed and constructed so that the temperature of the sewage will be reduced to permit congealing or separation of grease, and easy access for cleaning.

5. Commercial facilities generating up to 200 gallons per day of wastewater from the fixtures noted in section 11.7.A.2 above, shall install a 810 gallons capacity minimum size grease interceptor or an interior pressure Uniform Plumbing Code (UPC) rated grease interceptor on the kitchen drain.

6. Commercial facilities generating 200 gallons per day or more from the fixtures noted in 11.7 A.2 above, shall install a grease interceptor sized in accordance with the Permit Authority requirements. The grease interceptor shall be a minimum size of 810 gallons capacity.

7. Each grease interceptor shall be so installed and connected that it shall be easily accessible for inspection, cleaning, and removal of the intercepted grease. Grease interceptors shall be located outside.

Section 12 Criteria for Non-Standard Experimental OWTS

12.1 General

A. Permit Authority and the North Coast and San Francisco Bay RWQCBs entered into Memoranda of Understanding (MOUs) in the early 1990s. The MOUs were for the evaluation of specific proposals for the installation and use of non-standard OWTS. The OWTS Policy Tier 2 requirements supersede those Agreements. The criteria for the design concepts of non- standard OWTS are to incorporate features for:

   1. the prevention of transmission of disease;

   2. dispersal of wastewater below the surface of the ground;

   3. the prevention of contamination of groundwater and other beneficial water by discharge from OWTS.

B. All Non-Standard Experimental OWTS shall be designed by a Qualified Consultant.

C. There are two basic types of non-standard OWTS: Experimental and Alternative. Non-standard OWTS are used to overcome one or more adverse site or soil condition such as high groundwater, slowly permeable soils, or other limiting condition or where increased wastewater treatment is needed. Unlike conventional OWTS, non-standard OWTS vary in design and concept depending on the site and soil conditions.

D. Permit Authority monitors the operation and maintenance of all non-standard systems. Inspection frequency may vary but is dependent upon the level of monitoring compliance by the system owner/operator.

E. Permit Authority shall submit results of the monitoring inspection to the RWQCB in the form of an annual report for each calendar year. The report may incorporate information provided in the self- monitoring reports.

   1. The Annual Report will include the following:

      a. Status of staffing adequacy for the number of non-standard OWTS in the program
      b. Percentage of Owner Self-Monitoring completion for systems on 1-year, 2-year, and 3- year frequencies
      c. Percentage of PRMD staff monitoring completion for systems on 1-year, 2-year, and 3- year frequencies.

F. In addition to the requirements of this Article, Experimental and Alternative OWTS are also subject to the Section 13 Operational Permit and Monitoring Program requirements.

12.2 Restrictions

A. Because of evolving technology and problems that may be discovered through the monitoring program, the regulations for non-standard OWTS may change. Property owners are cautioned that regulations for non-standard OWTS may change by action of the RWQCB or PRMD. Therefore, despite previously performed and accepted work by PRMD, any proposal for a non- standard OWTS must meet the regulations that are in effect at the time that PRMD approves the OWTS permit application.

B. OWTS shall not be placed in areas that have been filled, excavated, ripped, plowed altered, modified, or in areas of flooding, drainage problems, or geologic instability.

   1. Such areas that have been filled excavated, ripped, plowed, altered, and/or modified may be acceptable if the soil is stable and soil evaluation indicates characteristics acceptable for installation of an OWTS such as approved structure, texture, consistency, pore space, percolation rate.

   2. The only exception or variance to this is for repairing malfunctioning OWTS for existing legal residences or businesses.

   3. Exceptions or variances will not be granted to allow increases of existing wastewater discharges.

C. When a non-standard OWTS is proposed in order to increase the sewage discharge of an existing use, the existing system must be brought into compliance with all current regulatory requirements.

12.3 Experimental OWTS

A. A non-standard Experimental OWTS is one that has been developed, researched, and monitored by a major land grant university or equivalent and meet National Science Foundation (NSF) criteria and certification. The PRMD Liquid Waste Specialist reviews all technical and research information regarding proposed non-standard Experimental OWTS.

   1. The Liquid Waste Specialist will present any promising non-standard Experimental OWTS to the Regional Water Quality Control Board (RWQCB) for technical review and approval. If both PRMD and RWQCB staff approve the non-standard Experimental OWTS, design parameters, site and soil characteristics, a site specific monitoring program will be established.

2. Installation of a maximum of 10 systems per year shall be allowed for new construction within each Regional Board jurisdiction with similar site and soil conditions.

3. Intensive monitoring (two or more inspections per year) performed for at least two normal winters is required.

4. PRMD may consider whether an additional period of monitoring or an additional number of systems shall be installed prior to Alternative non-standard OWTS status consideration.

5. The Liquid Waste Specialist may request the RWQCB permission to proceed to Alternative non-standard OWTS status if the intensive monitoring indicates satisfactory results.

B. All Non-Standard Experimental OWTS shall be designed by a Qualified Consultant.

C. Non-standard Experimental OWTS limitations include the following

1. Repair of existing malfunctioning residential and commercial OWTS.

2. The expansion of use for existing residential and commercial systems (limited to 33%) may be allowed by the Permit Authority.

3. Maximum peak loads are 600 gallons per day for new single family homes and maximum average flows of 1000 gallons per day for new commercial establishments.

4. Not acceptable as justification for land division.

5. Not approved for use in a sewer hookup area, septic tank ban area, or County identified Variance Prohibition Areas, except as a repair.

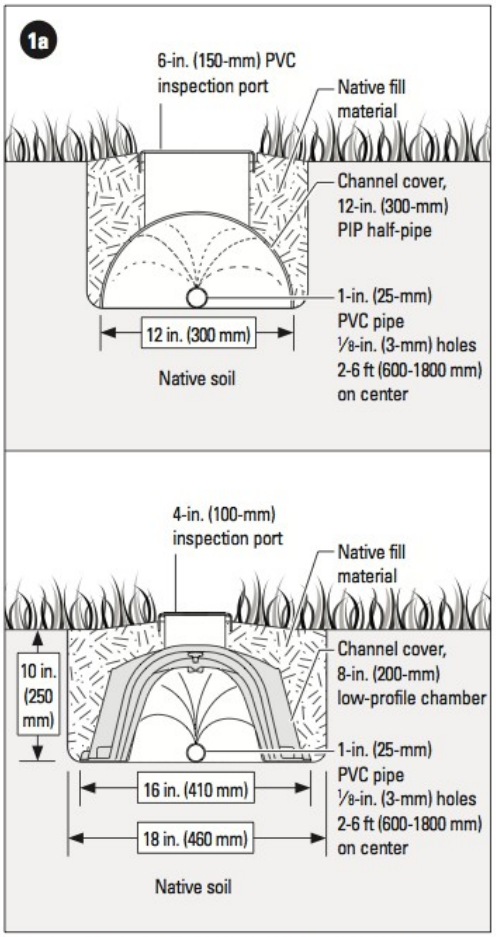
D. At this time, the bottomless sand filter OWTS is considered an approved Experimental OWTS.

12.4 Bottomless Sand Filter OWTS

A. The Bottomless Sand Filter OWTS shall meet the site, design, construction and performance criteria of Section 12.6 Bottomless Sand Filter (Geographic Waiver) with the only exception is that the existing structure is not required to be located on the 100 year flood plain, but may be located outside the 100 year flood plain.

12.5 Gravel-less Pressurized Dispersal Channel (GPDC)

A. Gravel-less Pressurized Dispersal Channel (GPDCs) are designed for subsurface dispersal of high-quality effluent after secondary treatment. There are two typical configurations. One consists of perforated laterals laid in a 12-inch wide infiltration channel, covered with sections of plastic half-pipe and shallowly buried in native soil. The other uses an 18-inch infiltration channel and sections of 8-inch low-profile HDPE chamber material.



Cross sections of typical half-pipe and low-profile SPDS installations showing dimensions and materials

B. The site criteria for Gravel-less Pressurized Dispersal Channel OWTS includes the following:

1. Depth to a limiting condition and permeable soils (1-120 mpi) below the dispersal line shall be a minimum of 24 inches.

2. The soil above the PVC line proposed depth shall be permeable (1-120 mpi). This excludes massive or platy structured soils. Soils subject to flooding, excessive irrigation, farming practices, grading, ripping or roto-tilling are also not acceptable. The quality of acceptable soils above the line shall be equal to those below the line.

3. A minimum of 24 inches of permeable soil below dispersal depth shall extend a horizontal distance of no less than 25 feet down gradient from the edge of the last proposed line, including expansion areas.

4. GPDC sites shall not exceed thirty (30) percent slope without an approved waiver and a geotechnical study required for slope stability and suitability.

5. GPDC sites shall not exceed twenty-five (25) percent slope when fill is placed over the dispersal system.

C. The design criteria for GPDC OWTS includes the following

1. Separation between laterals shall be a minimum of three (3) feet.

2. GPDC installations space orifice holes 24 inches min to 72 inches max on center.

3. A GPDC System is typically installed 10 inches into native soil. A minimum native soil depth of 6 inches may be allowed with disinfection. The minimum soil cover over the orifice shield is 2 inches. The maximum soil cover allowed is 18 inches. (See Figure 1a).

4. The designer shall also determine the number of zones, the number of doses, the quantity of the dose, the head losses, spacing of lines, spacing of orifices, diameter of the pipe (typically 1" PVC), and pump size.

5. The length of each dispersal line shall not exceed 75 feet to insure equal distribution to each orifice. If multiple zones are designed, dosing must be automatically alternated between each zone.

6. All GPDC Systems require an approved packed bed media filter supplemental treatment unit for treating septic effluent. The level of supplemental treatment must comply with NSF Standard 40 or to the satisfaction of the administrative authority.

7. Designer shall employ measures to prevent uneven distribution of the dispersal field due to drain down following a pump cycle. Per California Plumbing Code, spring check valves are not allowed for wastewater applications.

8. Provide 2 feet of solid pipe between the manifold and the first orifice.

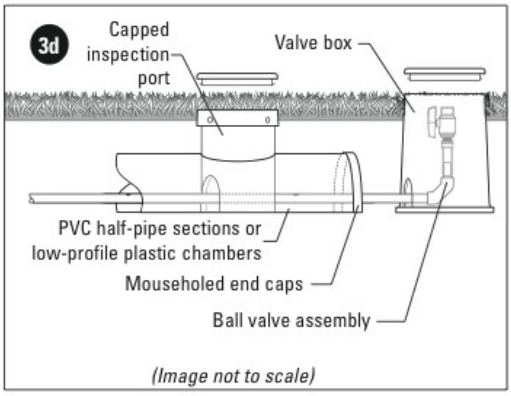
9. At the end of each lateral, install a sweep ell (or two 45° elbows) and a ball valve with a threaded plug.

10. All system components shall be appropriately sized for the system dosing flow rates, and shall meet specifications of the manufacturer. All transport piping, supply and return manifolds and fittings must be Schedule 40 PVC or Schedule 80 PVC if threaded fittings are utilized. All filters must be sized to operate at a flow rate greater than or equal to the maximum design discharge rate of the system.

11. All GPDC System designs shall demonstrate that sufficient suitable area exists to construct two hundred (200) percent reserve area. Because GPDC Systems are experimental, in cases of split system designs, the GPDC System shall be installed as the primary system, and the other type of dispersal system shall be the 200 % expansion system.

12. Totalizing flow meters (in gallons) are required on the supply line.

Flow meters must be installed in a readily accessible location for reading and servicing.



13. A controller capable of timed dosing is required.

14. Disinfection of the treated wastewater shall be incorporated in cases of well-drained soils (<1 mpi or faster) or where dispersal systems only have a minimum of 6 inches of native soil cover above the shield (see Figure x). If 6 inches of approved fill is added above the 6 inches of native soil cover, disinfection will not be required.

15. For aerobic treatment unit (ATU) systems that function with external blowers, a cutoff switch or interlock that disables the pump must be built into the control panel so the blower may not be disconnected.

D. The following construction criteria for GPDC OWTS includes the following:

1. Construct trenches with special attention to proper elevation and contour.

    a. Shallow Trenches can be dug (by hand or with a trenching machine.
    b. Trenches shall not be installed when the soils are wet or excessively damp state.
    c. Sidewall of trenches shall be scarified to remove all smears.
    d. Install perforated piping, placing orifices upwards for the hydraulic test.
    e. Trenches can be straight, or they can be curved to fit terrain and complement vegetation, but they must be set on level grade.
    f. Lay the half-pipe (or low-profile chamber) sections over the laterals, overlapping the section ends by a few inches. For covering curving laterals, half-pipe section ends can be cut at an angle and overlapped to match the curve of the lateral. Install one inspection port halfway along each lateral (See Figure 1a)

2. Valves must be readily accessible for service and/or inspection. All valve boxes must be protected from gopher soil movement. A detail of the valve box must be included on the plans. Specify concrete, hardware wire or similar bottom.
3. Perform hydraulic test after the distribution system has been completed.

    a. Size of orifice shall be 1/8” – 3/16”.
    b. Pump must be adequate to deliver the required orifice discharge range

of 24 inches (3/16" hole) and 60 inches (1/8" hole) for upward discharge to the lateral.

c. Distribution to all laterals shall be balanced.
d. This test shall be inspected by the designer/consultant and the ~~PRMD~~ Permit Authority Environmental Health Specialist.

E. Establish the finished grade of the GPDC OWTS by track rolling and grooming by hand. Backfill the excavation with caution. Do not compact the soil around the half-pipe or chamber.

F. Fill material may only be placed above native soil for soil cover, and shall not be used to meet required soil depth minimums. The system designer shall describe the type of fill to be placed in terms of texture and structure, the depth and method of ripping before placement. No part of the GPDC dispersal field may be located where the site slope exceeds twenty-five (25) percent when fill is used.

1. A ground cover (turf, fruit trees or other appropriate landscaping) must be planted over the dispersal field after installation to provide additional treatment, prevent erosion and increase wastewater reuse through plant evapotranspiration.

2. Native material is acceptable if there are no large or sharp rocks that may damage the pipe walls. If native material is not usable, backfill with sand or pea gravel, or use an imported material that is approved by your local regulator.

3. Install performance wells and complete all details as shown on the plans.

4. After the #189 septic electrical inspection has been completed by the Building Inspector, a start up inspection must be scheduled with the system designer, installer, service provider and ~~PRMD Well & Septic staff~~ Permit Authority.

5. Prior to OWTS final approval, acceptable erosion control must be completed.

G. The performance wells criteria for GPDC OWTS includes the following. A minimum of five performance wells shall be installed within and around the system to a depth of 24 inches below proposed trench bottom.

1. Two performance wells shall be installed between trenches in the middle of the leach field.

2. Two performance wells shall be installed 25 feet down slope of the lowest trench line.

3. One performance well shall be installed at 10 feet upslope of the highest trench line.

4. Additional performance wells may be required for systems longer than 75 feet.

5. Permit & Resource Management Department may require that performance well locations be changed in special situations.

6. Performance wells shall be properly installed to provide easy access.

Section 13 Criteria for Non-Standard Alternative OWTS

A. An Alternative non-standard OWTS is any sewage treatment and dispersal system other than a conventional OWTS or non-standard Experimental OWTS. An Alternative OWTS has demonstrated satisfactory operation, maintenance, and monitoring under the Experimental OWTS phase of the non-standard system OWTS program and the Permit Authority and RWQCBs certify the OWTS as an approved Non-Standard Alternative OWTS.

1. The currently approved Alternative OWTS include the following:

    a. Pretreatment units that meet the National Sanitation Foundation (NSF) Standard 40 and have received Permit Authority approval
    b. Wisconsin mound systems
    c. Shallow trench pressure distribution
    d. At-Grades
    e. Shallow in-ground
    f. Bottomless sand filters (geographic waiver)
    g. Drip dispersal

B. All Non-Standard Alternative OWTS shall be designed by a Qualified Consultant.

13.1 Pretreatment Units

A. Pretreatment units may be used in conjunction with standard or nonstandard systems where the site and soil conditions are not adequate. Standard systems with a pretreatment unit are considered to be a standard system unless the pretreatment unit is required in which case it will be considered an alternative nonstandard system.

B. In cases where a pretreatment system is used, Permit Authority and the RWQCB may allow a reduction in the minimum depth of soil below trench bottom to two (2) feet. However, in all instances, at least two or the required three feet of soil beneath trench bottom must be acceptable native soil.

C. Pretreatment units that may be permitted in Sonoma County must meet National Sanitation Foundation (NSF), Standard 40 by an ANSI Accredited Certification Body (ACB) and receive prior written approval of Permit Authority.

D. Recirculating sand filters are also an approved pretreatment unit. Sand filtration

may be defined as the intermittent application of wastewater to a bed of granular material that has an under drain to collect and discharge the final effluent. The purpose of sand filters is to pretreat the effluent and improve wastewater quality.

1. The design of sand filters in Sonoma County is based on the “Guidelines for the Use of Sand Filters” (Technical Review Committee, August 2, 1989. Washington State Department of Health, Olympia, Washington). Under the Permit and Resource Management Departments waiver standards, designers may propose to the liquid waste specialist, the use of sand filters to justify increasing soil application rate.

13.2 Mound OWTS

A. Mound OWTS are based upon the Small Scale Waste Management Project, University of Wisconsin at Madison, Wisconsin Mound Soil Absorption System Siting, Design and Construction Manual, by James C. Converse and E. Jerry Tyler, January 2000. Mound systems are designed to overcome restrictive conditions for soil permeability and depth to groundwater below the bottom of the system. Designers shall use the same methodology and nomenclature as the most recent Wisconsin Mound Soil Absorption System Siting, Design and Construction Manual.

B. The site criteria for Mound OWTS includes the following:

1. Percolation rate of 1-120 minutes per inch (mpi)

    a. Percolation rate requirements apply to the first 24 inches of soil as measured from native grade. See Section 7 site evaluation and percolation test requirements.
    b. Presoak remaining in 24" deep perc test holes may indicate lack of soil depth.
    c. Rates faster than 1 mpi are not acceptable.

2. Minimum elevated groundwater level is 24 inches from native grade.

3. Minimum depth of suitable permeable soil is 24 inches from native grade.

    a. The rock content (as retained on the #10 Sieve) shall not exceed 50% by volume within the first 24 inches of soil from native grade.
    b. The minimum depth to fractured rock, impermeable soils, such as hardpans and claypans, and consolidated bedrock is 24 inches.

c. The addition of an approved pretreatment unit does not mitigate one foot of the required minimum 24 inches of suitable soil beneath the mound. Two feet of acceptable native soil from native ground is required.

4. The minimum depth of permeable soil (24 inches) shall extend a minimal horizontal distance of at least 25 feet down gradient from the edge of the sand perimeter.

5. Mound systems are allowable on slopes up to 20%.

6. Placement of Mound OWTS into areas that require the removal of large trees, boulders, or rock outcroppings is not recommended.

C. The design criteria for Mound OWTS (see Figures 13.2a and 13.2b) includes the following

1. Wastes with a high biological oxygen demand are not suitable for mound systems without approved pretreatment sufficient to lower the waste strength to the level of that septic tank effluent as specified in Section 13.1.

2. Distribution (Gravel) Bed

a. Sand Fill Loading Rate

i. 1.0 gallons/square foot/day for residential type systems.
ii. 0.8 gallons/square foot/day for all commercial type systems.
iii. Reduced loading rates for high strength waste may be required.

3. Linear Loading Rate

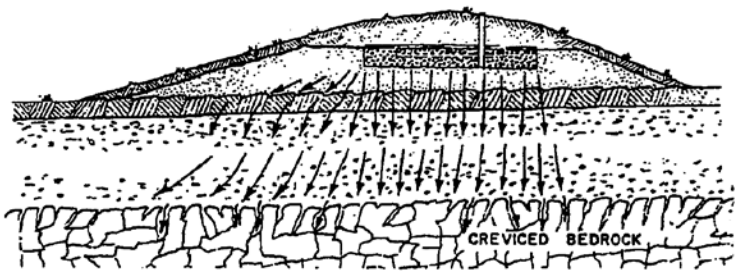
a. Designers shall estimate the linear loading rate for all proposed Mound OWTS and shall design the width dimensions of the gravel bed accordingly, so that the distribution bed is long and narrow and on the contour.
b. When the depth to a limiting condition, e.g., impermeable soil layer or rock is only 24 inches, the linear loading rate shall not exceed 4 gallons/lineal foot/day.
c. If it can be demonstrated that the wastewater flow will be vertical, as well as horizontal, a higher loading rate may be proposed.
d. Refer to Table 13.2a and Figure 13.2d for the Linear Loading Rates based on Limiting Conditions.

Table 13.2a Linear Loading Rates (LLR) Based on Limiting Conditions

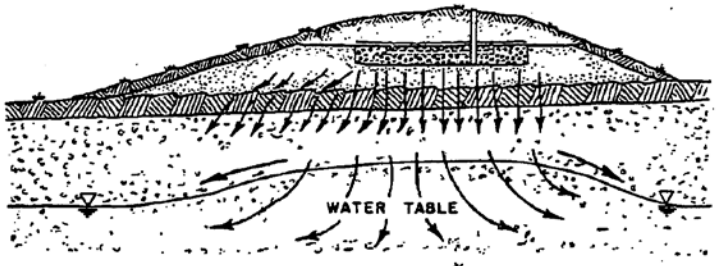
Nature of Limiting Condition	LLR Range (gpd/linear ft)
Solid Bedrock	3-4
Impermeable Soil Layer	3-4
Semi-Permeable Soil Layer	5-6
Fractured Compacted Till	5-6
Seasonal High Water Table	6-8
Creviced or Fractured bedrock	8-10
Sand and/or Gravel Layer	8-10

Figure 13.2a Linear Loading Rate

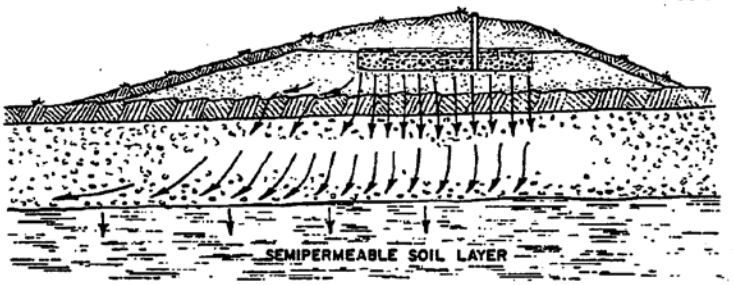
Mound System overlaying a permeable soil lens over creviced bedrock.
Estimated Linear Loading Rate = 8 to 10 gal/day/LF



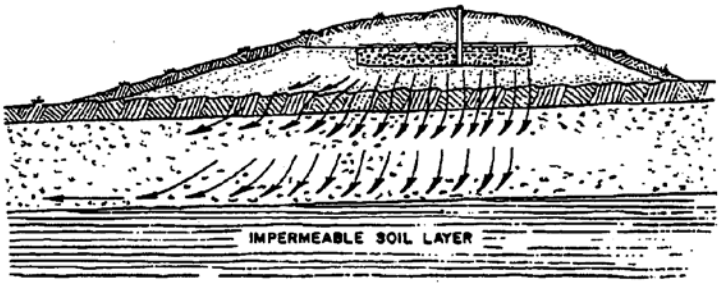
Mound System overlaying a deep permeable soil lens over a fluctuating water table.
Estimated Linear Loading Rate = 6 to 8 gal/day/LF



Mound System overlaying a shallow permeable soil lens over a semi-permeable soil layer.
Estimated Linear Loading Rate = 5 to 6 gal/day/LF



Mound System overlaying a shallow permeable soil lens over an impermeable soil layer.
Estimated Linear Loading Rate = 3 to 4 gal/day/LF



4. Infiltration Area (Dispersal Bed)

   a. Sizing calculations for all mound dimensions shall be provided with all proposals. Refer to Figures 13.2a and 13.2b. The size of the infiltration area (the bottom infiltrative surface area of the bed) is determined by applying the following formula

      i. Infiltrative Surface Area (sq ft) = Daily Design Flow (gal/day)/ Sand Fill Loading Rate

Figure 13.2b Mound Cross Section

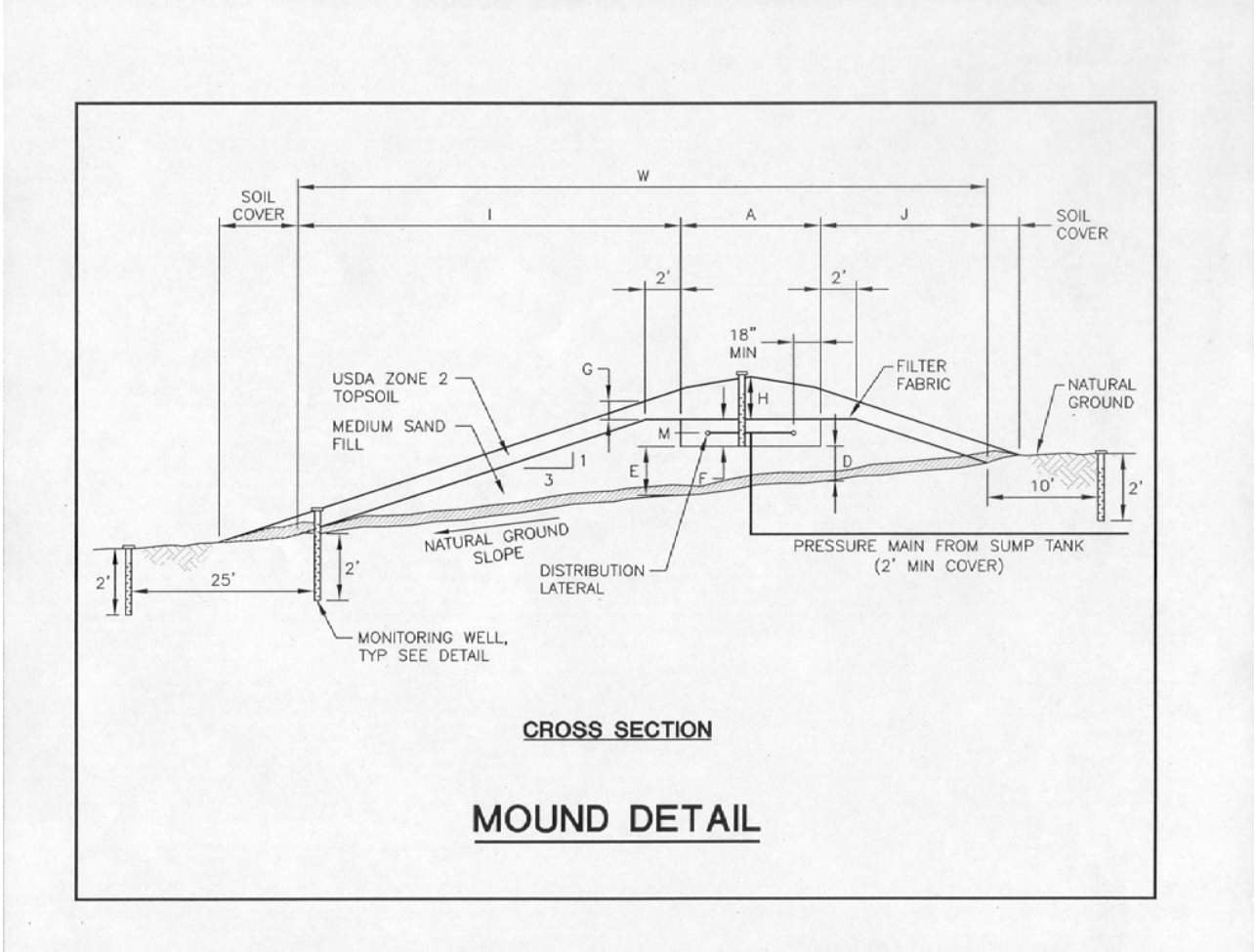
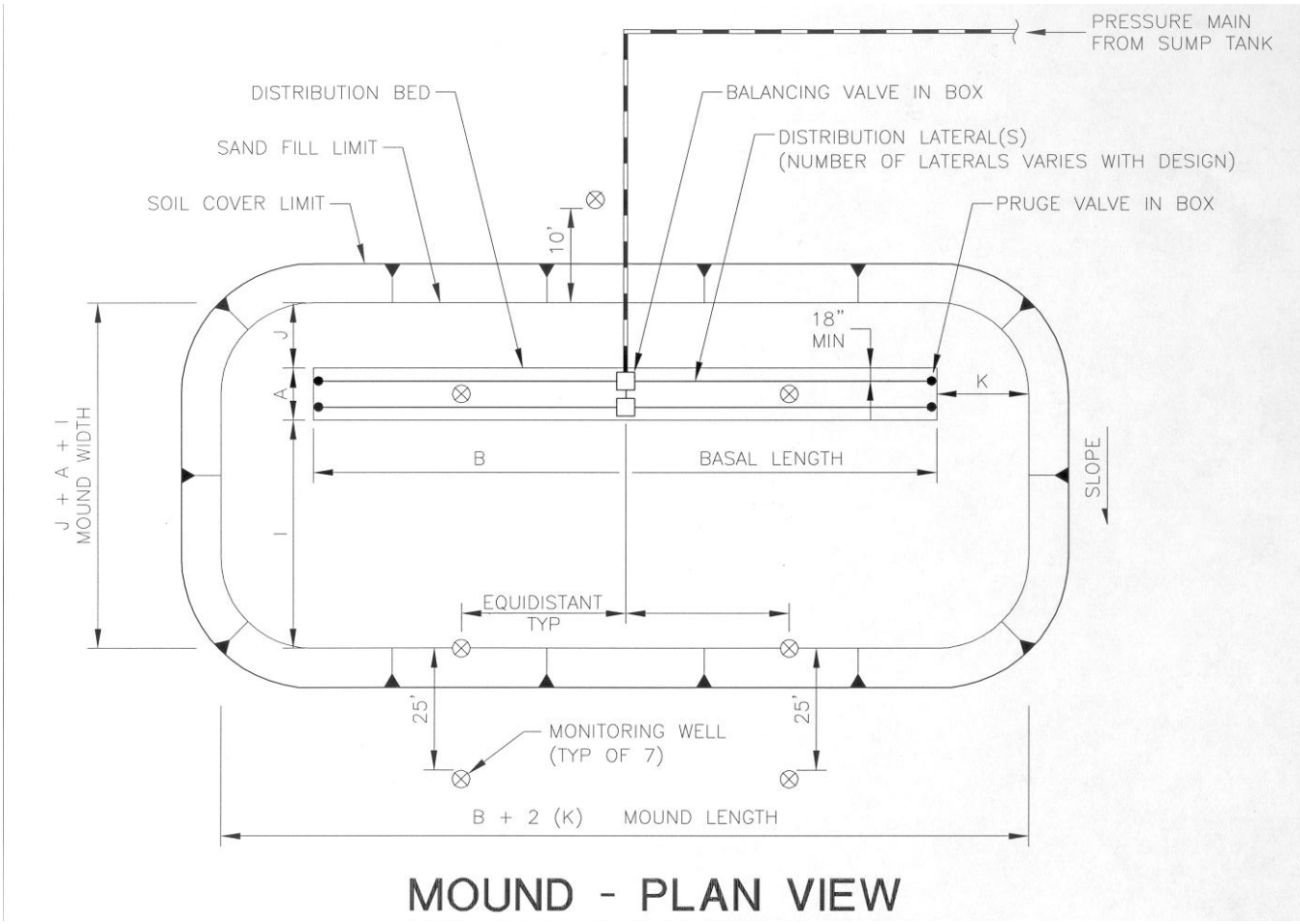


Figure 13.2c Mound Plan View



b. Dispersal Bed Width—The dispersal bed width (A) is determined by the Linear Loading Rate of certain soil type and depth. Linear Loading Rates are shown in Table 13.2a and Figure 13.2d. Maximum bed width shall be ten (10) feet.

   i. Dispersal Bed Width (A) = Linear Loading Rate/ Sand Fill Loading Rate

c. Dispersal Bed Length— The length of the infiltration area (the infiltrative surface area of the dispersal bed) is determined by applying the following formula

   i. Dispersal Bed length (B) =Required Infiltrative Surface Area/Dispersal Bed Width (A)

d. Dispersal Bed Depth (F)—A minimum of six (6) inches of aggregate for residential and nine (9) inches for commercial systems is placed beneath the distribution pipe and two
(2) inches of aggregate is placed above the pipe.

   i. Dispersal Bed Grade—The bottom of the dispersal bed must be level.
   ii. Filter Media Depth—The depth of filter media shall be at least twelve (12) inches under all parts of the dispersal bed.
   iii. The depth of filter media below the dispersal bed varies with ground slope according to the following formulas
   iv. Filter media depth below upslope edge of dispersal bed (D) = one (1) foot.
   v. Filter media depth below downslope edge of dispersal bed (E) = one (1) foot+[% natural slope as a decimal x width of dispersal bed (A)]

e. Filter Media Length and Width—The length and width of the filter media are dependent upon the length and width of the dispersal bed, filter media depth and side slopes of the filter media.
f. Side slopes must be no steeper than three-to-one (3:1) (i.e. three (3) feet of run to every one (1) foot of rise).
g. The filter media length consists of the end slopes (K) and the dispersal bed length (B).
h. The filter media width consists of the upslope width (J), the dispersal bed width (A), and the downslope width (I). On sloping sites, the downslope width (I) will be greater than on a level site if a three-to-one (3:1) side slope is maintained. Table 13.2b gives the slope correction factor (multiplier) for slopes from zero (0) up to twenty (20) percent with a three-to-one (31) side slope.
i. The sand fill shall be level and extend a minimum of twenty-four (24) inches horizontally beyond the dispersal bed on all sides, and then uniformly slope as determined by the mound dimensions. On slopes greater than two (2) percent, the twenty-four (24) inch dimension may be reduced to twelve (12) inches on the uphill side of the distribution bed.
j. Slope Width and Length of the Mound System

   i. For sloping sites the downslope width (I) and upslope width (J) are a function of the depth of the sand fill below the respective downhill or uphill side of the dispersal bed, the desired side slope, three-to-one (31), and the slope correction factor. See Table 13.2b.
   ii. For level sites and end slope length (K), no slope correction factor is used.
   iii. Upslope width (J) = (D+ F)*(3) (slope correction factor)
   iv. Downslope width (I) = (E+ F)*(3) (slope correction factor)
   v. End slope length (K) = {(D+E)/2 + F}*(3)

Table 13.2b Mound Slope Correction Factors

SLOPE %	DOWNSLOPE (I) CORRECTION FACTOR	UPSLOPE (J) CORRECTION FACTOR
0	1	1
2	1.06	0.94
4	1.14	0.89
6	1.22	0.86
8	1.32	0.80
10	1.44	0.77
12	1.57	0.73
14	1.72	0.71
16	1.92	0.68
18	2.17	0.65
20	2.50	0.62

k. Basal Area Calculation—The amount of sand basal area required is dependent upon the permeability of the original soil.

i. For level sites the total basal area [length of filter media (L) x width of filter media
(W) beneath the filter media is available for effluent absorption into the soil.

ii. For sloping sites, the only available basal area is the area beneath the dispersal bed (A x B) and the area immediately downslope from the dispersal bed [bed length (B) x downslope width (I)]. It includes the area enclosed by [B x (A + I)]. The upslope and end slopes will transmit very little of the effluent on sloping sites, and are therefore disregarded.

iii. The available basal area must equal or exceed the required basal area (aa) Basal area required = Daily flow / Soil Infiltration rate
(bb) Basal area available = B x (A + I +J) on sloping site or B x (A +I) on level site.

5. Configuration

a. Only single distribution beds are acceptable. Dual beds are not allowed.
b. The maximum width of any gravel bed is 10 feet.
c. The depth of the gravel bed shall be 6 inches below the pipe for residential systems and 9 inches for commercial systems and include 2 inches of gravel cover over the pipe.

6. Aggregate

    a. 3/8 inch double washed pea gravel size to 2.0 inch double washed drain rock.

7. The percentage of fines (<0.035 mm) of washed gravel shall not exceed 1% by weight.Natural Contour

    a. The distribution bed shall explicitly follow the natural contour of the ground. The bed must be installed within a tolerance of 0.25 feet (3 inches) vertically per 100 feet horizontally.
    b. Distribution beds shall be angled or curved to meet this requirement.
    c. The distribution bed shall not be placed in a concave landscape position.

8. Reserve Expansion Area

    a. On parcels created before October 1971, a 100% reserve area is required.
    b. For commercial systems and parcels created after October 1971, a 200% reserve area is required.

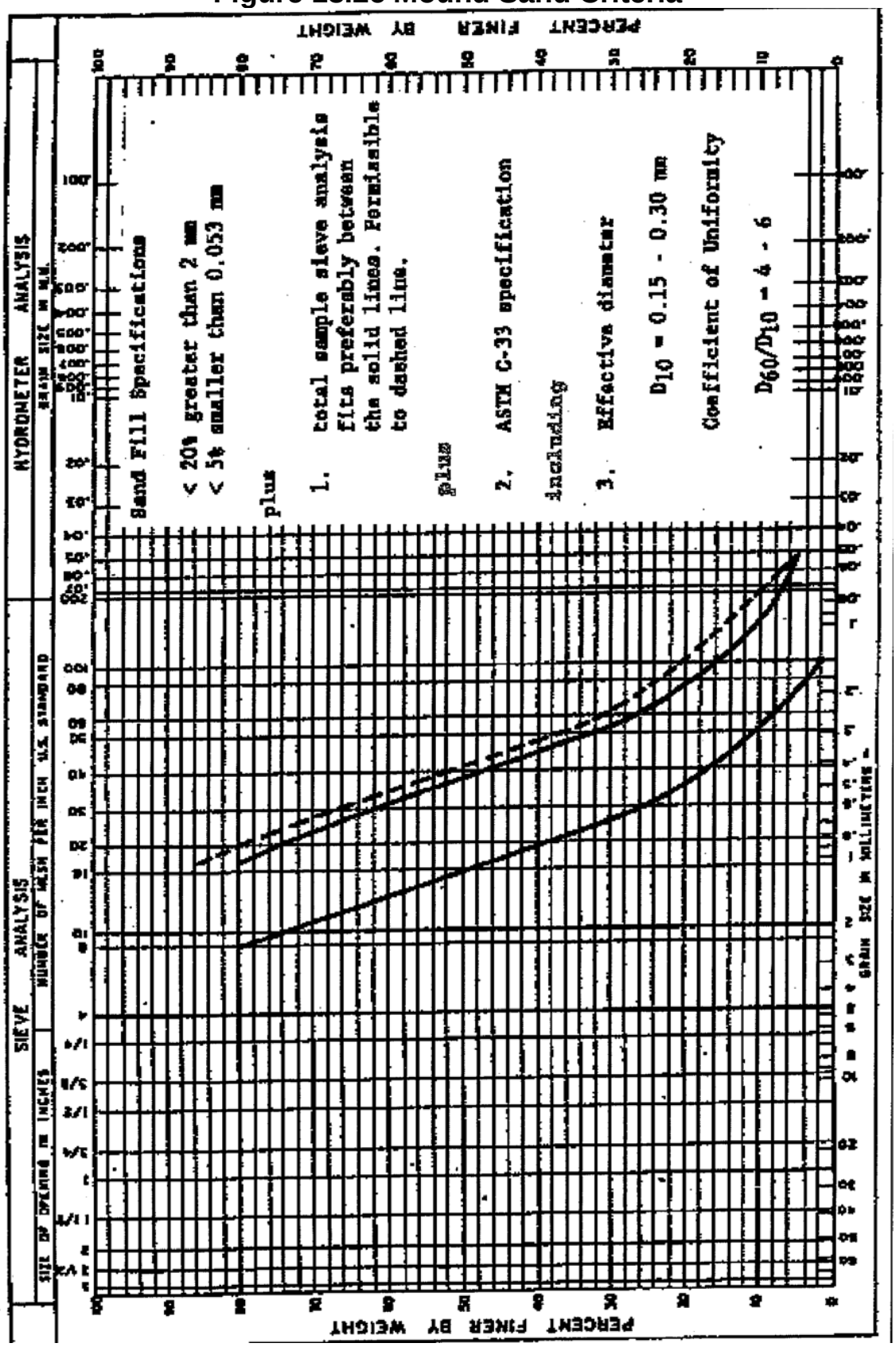
9. Sand Fill (Basal) Area

    a. The sand-fill (basal) area, shall, at a minimum, provide adequate basal (absorption area). The sand area size is based upon the average percolation rate and the sewage application rate chart. See Table 7.2a.
    b. Sand fill media shall conform to the ASTM C-33 sand with less than 5% fines less than
    0.53 mm sand specification to Wisconsin mound criteria (see Table 13.2d and Figure 13.2e).

Table 13.2c Mound Sand Specification

Sieve Size	Percent Passing
#3/8	100%
#4	95-100%
#8	80-100%
#16	50-85%
#30	25-60%
#50	10-30%
#100	2-10%
#200	0-5%

Figure 13.2c Mound Sand Criteria

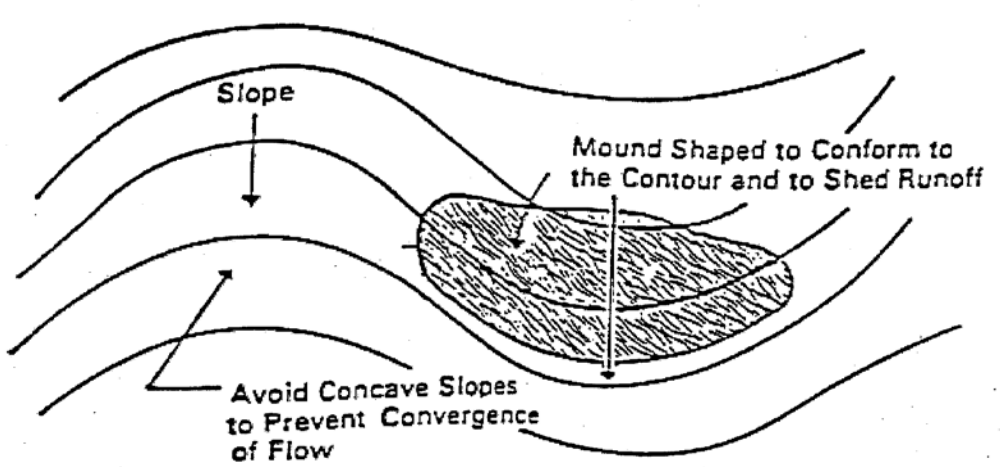


c. the ground slopes greater than 1%, the area uphill from the edge of the gravel distribution bed shall not be included in the calculations for the required basal area.
d. Areas beyond the distal end of the gravel bed shall not be included in the calculations for the required basal area for systems exceeding 1% slope.

10. Configuration

a. The toe of the sand fill shall follow contour, and shall not deviate more than 0.25 feet (3 inches) in elevation per 100 foot run.

Figure 13.2d Contour Conformance



b. The sand fill configuration shall extend a minimum of 24 inches level from the edge of the distribution bed on all sides, then uniformly slope as determined by the mound dimensions. On the slopes greater than 2%, the 24 inch dimension may be reduced to 12 inches (minimum) on the uphill side of the distribution bed only.

11. Soil Cover

a. A minimum of 6 inches in depth after settling over the gravel bed portion of the mound and over the remainder of the sand portion.
b. Mounded to a height of 12 inches after settling at the midsection of the gravel bed.
c. The distal ends and uphill sides soil cover width requirements are 4 feet

d. Downslope soil cover shall conform to Table 13.2d.

Table 13.2d Mound Downhill Soil Cover Requirements

SLOPE	COVER (lineal feet beyond gravel)
0-2%	4
2-4%	6
4-6%	8
6-8%	10
8-12%	12
12-16%	16
>16%	20

e. The quality of the soil structure and texture (USDA Classification) shall be at least equal to that of the topsoil existing on the site.

12. Distribution System

a. Designers shall calculate the total dynamic head loss of the entire distribution systems.

i. Vertical differences.
ii. Length of entire piping system.
iii. Loss of all valves, tees, elbows, and appurtenances.
iv. Head Loss shall be referenced as feet of elevation.
v. Hydraulic orifice discharge shall be a minimum of 60 inches for upward discharge. Orifices shall have a protective shield.
vi. Orifice spacing shall be a maximum of 36 inches on center. (Closer spacing is preferred.)
vii. Size of orifice shall be 1/8" – 3/16".

b. System distribution manifolds shall have a balancing valve at the beginning of each perforated pressurized line and a purge valve at the end.

i. All valves shall be protected and encased within plastic, concrete or other approved type box to provide easy access and maintenance. Metallic valves are prohibited.
ii. Box size shall be 10 inches across or larger, round or square, and

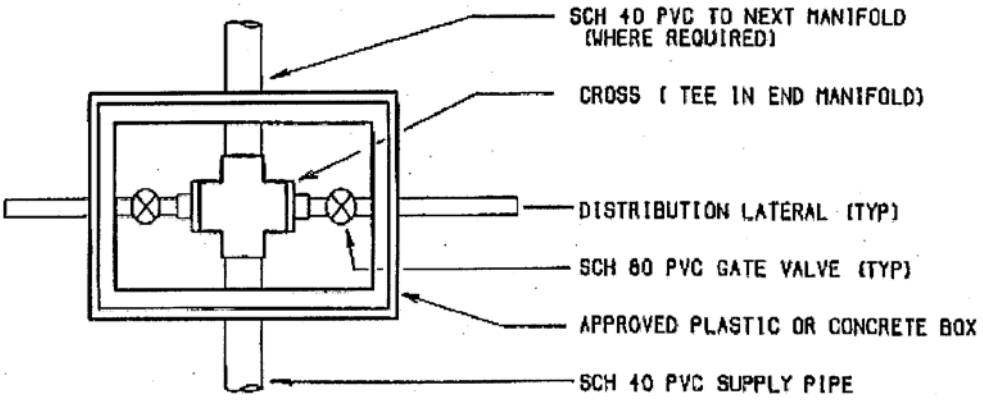
must allow enough room for maintenance and/or to install stand pipes onto the ends of the purge valves

iii. Balancing valves shall be PVC Schedule 80 (or higher) gate valves.

iv. Purge valves shall be PVC Schedule 80 gate or ball type valves.

v. Valve boxes shall be placed on screen blocks or equivalent and shall be designed, installed, and maintained so as to prevent soil and rodent intrusion into the box. See Figures 13.2f and g.

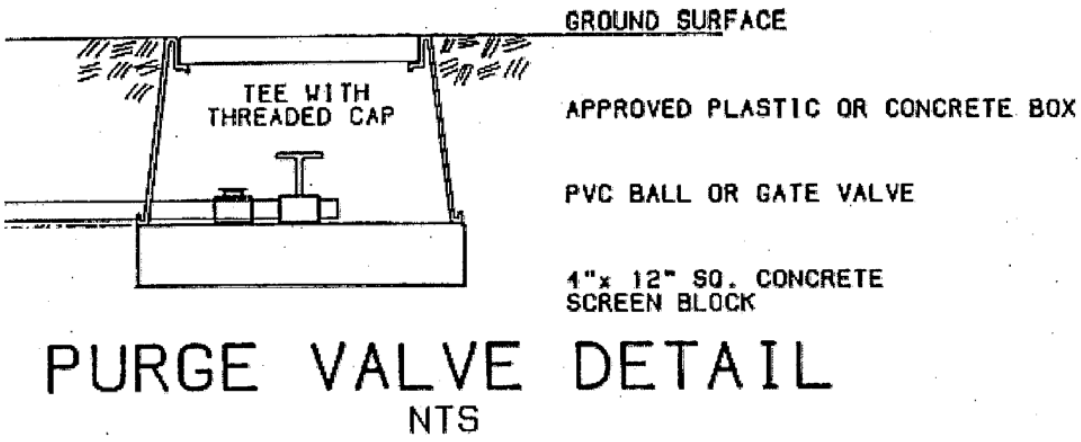
Figure 13.2e Balancing Valve



PLAN VIEW

BALANCING VALVE DETAIL

Figure 13.2f Purge Valve



c. Spacing of pressurized lines shall be based on gravel bed width.

Width of Gravel Bed	No. of Pressurized Lines
3 – 4 feet	1
4 – 6 feet	2
6 – 8 feet	3 – 4
8 – 10 feet	4 – 5

d. Distribution piping shall be Schedule 40 PVC or greater of at least three-quarter (3/4) inch diameter.
e. Maximum length of pressurized lines shall be 75 feet.
f. Maximum distance between perforations shall be 36 inches.
g. Perforations shall be directed upward and must be protected with a shield.

13. Sump and Pump

a. Refer to Sections 8.3 and 8.4 for required sump and pump features.

i. Automatic dosing siphons are not allowed in mound sewage dispersal systems.

D. The construction criteria for Mounds includes the following

1. These specifications must be included in the system plans submitted with the Permit Authority. The use of wheel type vehicles is prohibited.

    a. For the purpose of ripping.
    b. When driving on any areas that have been ripped.
    c. When driving on the sand fill.
    d. When placing or moving the soil cover.
    e. At any time that the soil conditions are wet, moist, or saturated.

2. Placement of the pressurized transmission line from the sump tank to the mound manifold shall be a minimum of 24 inches below the surface of the ground.

3. Site preparation of soil surface to a depth of 8 to 12 inches.

    a. Mow excessive vegetation.
    b. Remove trees.
    c. Cut and grind stumps to a depth of 12 inches.

4. Perform initial ripping parallel to the contours of the ground within the limits of the sand base; rippers set 8 to 10 inches apart.

5. After all the sand has been placed and prior to mound soil cover placement, rip the native soil that will interface with the mound soil.

6. Prohibit all traffic on any ripped surfaces until the full depth of fill or cover material has been placed.

7. Uniformly place and compress the sand fill by track rolling to a neat line to the grade determined by the mound dimensions. A tolerance of no more than 0.25 feet (3 inches) vertically, to 100 feet horizontally is allowed. Add additional sand as the sand fill area is compressed.

8. Construct gravel bed with special attention to proper elevation

    a. Temporary form boards are required for placement of the distribution bed gravel.
    b. Form boards shall be fully enveloped by the sand bed and shall be removed prior to cover placement.

9. Perform hydraulic test after the distribution has been completed.

a. Hydraulic orifice discharge shall be a minimum of 60 inches for upward discharge.
b. Orifices shall have a protective shield.
c. Distribution to all laterals shall be equal.
d. This test shall be inspected by the consultant and the Permit Authority.

10. Condition soil cover material with sufficient moisture to permit track rolling to a firm cohesive surface.

11. Establish the finished grade of the mound by track rolling and grooming by hand.

12. Complete proper drainage work and erosion control measures before final inspection.

13. Install monitoring wells and details as shown on the plans.

14. Prior to septic system final approval, acceptable erosion control must be completed.

E. The performance wells criteria for Mounds includes the following

1. A minimum of seven performance wells shall be installed within and around the mound system. Well screen is required for the perforated sections of the performance wells. See Figure 11.6.

a. Two performance wells extending to the bottom of the gravel bed shall be installed within the distribution gravel bed in proportionate locations.
b. Two performance wells shall be installed at the down slope sand toe of the mound at proportionate locations from centerline at a depth of 24 inches.
c. Two performance wells shall be installed at a depth of 24 inches 25 feet down slope of the sand toe mound at proportionate locations from the centerline.
d. One performance well shall be installed at a depth of 24 inches 10 feet upslope of the edge of the upslope sand bed at mound centerline for sloping sites and 25 feet upslope of for level terrain.
e. Performance wells shall be protected and encased within plastic, concrete or an approved equivalent to provide easy access.
f. All performance wells shall have concrete seals for the upper 12 inches

13.3 Shallow Trench Pressure Distribution (STPD) OWTS

A. Pressure distribution systems are designed for sites that typically have shallow top soils over slowly permeable or fractured subsoils on slopes up to 30%.

B. The site criteria for STPD OWTS includes the following

1. Percolation rate of 1-120 mpi for STPD systems on slopes up to 30%.

2. Rates faster than 1 mpi are not acceptable.

3. Percolation depth measured from native grade

    a. 24 inches minimum on slopes up to 20%.
    b. 30 inches minimum on slopes from 20 to 25%.
    c. 36 inches minimum on slopes from 25 to 30%.
    d. 60 inches maximum on slopes up to 30%.

4. Systems shall have a minimum depth of 24 inches of suitable soil beneath proposed trench bottom as established by

    a. Visual field observations and soil texturing to identify a limiting condition.
    b. The rock content (as retained on the #10 sieve) shall not exceed 50% by volume within the first 24 inches of soil below trench bottom.
    c. Soil hydro and bulk density tests (Zone 1 or Zone 2 soils).
    d. Plasticity Index tests as measured by ASTM D-4318-84 Atterburg Series, with results of
    <20 for Zone 3 or 4 soils.
    e. Soil percolation testing with rates of 120 mpi or better

5. Systems shall have a minimum depth of 24 inches below trench bottom to groundwater, fractured rock, consolidated rock, bed rock, or impermeable soils.

6. The addition of an approved pretreatment unit to a STPD does not mitigate one foot of the required minimum 24 inches of suitable soil beneath proposed trench bottom. Two feet of acceptable native soil beneath the proposed trench bottom is required.

7. A minimum of 24 inches below trench bottom of permeable soil shall extend a horizontal distance of no less than 25 feet down gradient from the edge of

the last proposed trench.

8. To maximize evapotranspiration, pressure distribution systems may not be installed below non-permeable type soils such as high shrink well clays, highly compacted soils, highly cemented soils, and/or massive or platy soil structures.

C. The design criteria for STPD OWTS includes the following

1. The minimum trench spacing shall be 6 feet, center to center, on slopes less than 20%.

   a. Greater trench spacing is recommended on steeper slopes.

2. Distribution trenches shall follow the natural contour of the ground; trench bottoms shall be level.

   a. The maximum deviation along the downhill side of the trench shall not vary more than
   0.25 feet (three inches) vertically per a 100 foot run. Distribution trenches shall be angled or curved to meet this requirement. The distribution field should not be placed on concave land forms.

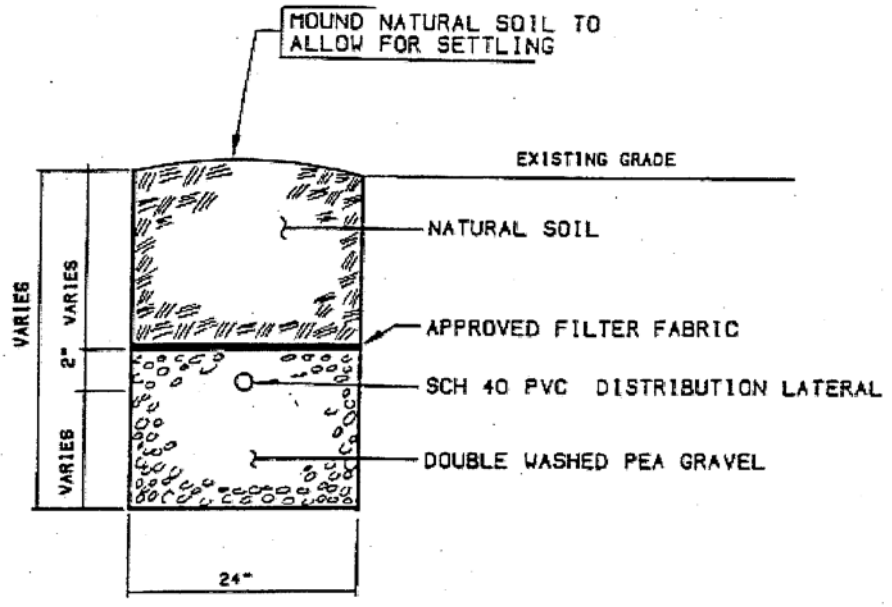
3. Approved distribution trench design. See Figure 13.3.

   a. Distribution piping shall be Schedule 40 PVC or greater of at least three-quarter (3/4) inch diameter.
   b. Approved aggregate below the pipe

      i. Perk rate of 5 - 120 mpi-- 3/8 to 3/4 double washed gravel with less than 1% fines passing the 200 Sieve.
      ii. Perk rate faster than 5 mpi--Pretreatment required before dispersal field.

   c. Two inches of aggregate is required over the perforated sections of the pressurized line.
   d. Minimum requirement of backfill is 12 inches over the pipe.
   e. Maximum trench depth shall be 60 inches.

Figure 13.3 STPD Trench Detail



Note: The allowable width of STPD dispersal trench 18-24”

4. Absorption Area. Shall be calculated as the sidewall beneath the distribution pipe. The bottom area of the trench is not included as absorption area for sizing purposes.

    a. The maximum sidewall area allowed for any system design is 3 square feet per lineal foot of trench.
    b. Center trench spacing shall be increased by 1 foot for every 6 inch increase in gravel depth.

5. Soil Cover. The quality of the back fill shall be consistent in structure and texture as the topsoil already existing on the site. A minimum depth of 12 inches is required.

    a. Soil structure and texture above the trench is extremely important to maximize evapotranspiration.
    b. Trenches shall not be installed below non-permeable types of soils (high shrink-swell clays, soils with massive structure, or highly compacted soils).

6. Designers shall calculate the total dynamic head loss of the entire distribution System, taking into account

    a. Vertical differences.
    b. Length of entire piping system.
    c. Loss of all valves, tees, elbows, and appurtenances.
    d. Head loss shall be referenced as feet of elevation
    e. Hydraulic orifice discharge shall be a minimum of 60 inches for upward discharge. Orifices shall have a protective shield.
    f. The recommended orifice spacing is 24 inches on center; however the maximum spacing is 36 inches. The first and last orifice shall be located one half orifice space from the ends of the distribution lines.

7. Balancing Valves and Purge Valves. System shall have a balancing valve at the beginning of each perforated pressurized line and a purge valve at the end. See Figures 13.2f and g.

    a. All valves shall be encased in plastic or concrete boxes. Metallic valves are prohibited.

        i. All balancing valves shall be PVC Schedule 80 (or equivalent) gate valves.
        ii. All purge valves shall be ball or gate PVC Schedule 80.

b. All boxes shall allow enough room for maintenance and adequate room to install stand pipes onto the end of the purge valves.

8. There shall be a minimum of 3 foot separation from the transmission line to the beginning of the aggregate portion of the trench or gravel bed.

9. The cross section of the transmission line and the beginning of the gravel portion of the trench shall be stepped so as to prevent seepage of effluent from trench to trench.

10. Maximum length of run for a perforated pressurized line shall be 75 lineal feet.

11. In the distribution network, orifices shall be placed in upward position with an orifice shield.

12. The sump and pump installation shall be as specified in Section 8.3 and 8.4

13. Dosing siphons are prohibited in all pressure distribution type systems.

D. The following construction criteria for STPD OWTS and specifications must be included with the system plans submitted with the permit application

1. Placement of the pressurized transmission line from the sump tank to the first manifold must be a minimum of 24 inches below the surface of the ground.

2. Construct trench beds with special attention to proper elevation and strict attention to contour.

    a. Trenches shall not be installed when the soils are wet or excessively damp state.
    b. Sidewall of trenches shall be scarified to remove all smears.
    c. Place aggregate into the trench.
    d. Install perforated piping, placing orifices upwards for the hydraulic test. Benching is strictly prohibited for the installation shallow trench pressure distribution systems regardless of the slope.

3. Perform hydraulic test after the distribution system has been completed.

    a. Pump must be adequate to deliver the required orifice discharge minimum of 60 inches for upward discharge to the lateral.
    b. Distribution to all laterals shall be balanced.
    c. This test shall be inspected by the designer/consultant and the Permit

Authority.

4. Establish the finished grade of the STPD system by track rolling and grooming by hand. Complete required drainage work and erosion control measures before final inspection.

5. Install performance wells and complete all details as shown on the plans.

6. Prior to septic system final approval, acceptable erosion control must be completed.

E. The performance wells criteria for STPD OWTS includes the following. A minimum of six performance wells shall be installed within and around the system to a depth of 24 inches below proposed trench bottom. See Figure 11.6.

1. One or more performance wells shall be installed between trenches in the middle of the leach field.

2. One or more performance wells shall be installed 10 feet down slope of the lowest trench line.

3. Two performance wells shall be installed 25 feet down slope of the lowest trench line.

4. One or more performance well shall be installed at 10 feet upslope of the highest trench line.

5. Additional performance wells may be required for systems longer than 75 feet.

6. Permit & Resource Management Department may require that performance well locations be changed in special situations.

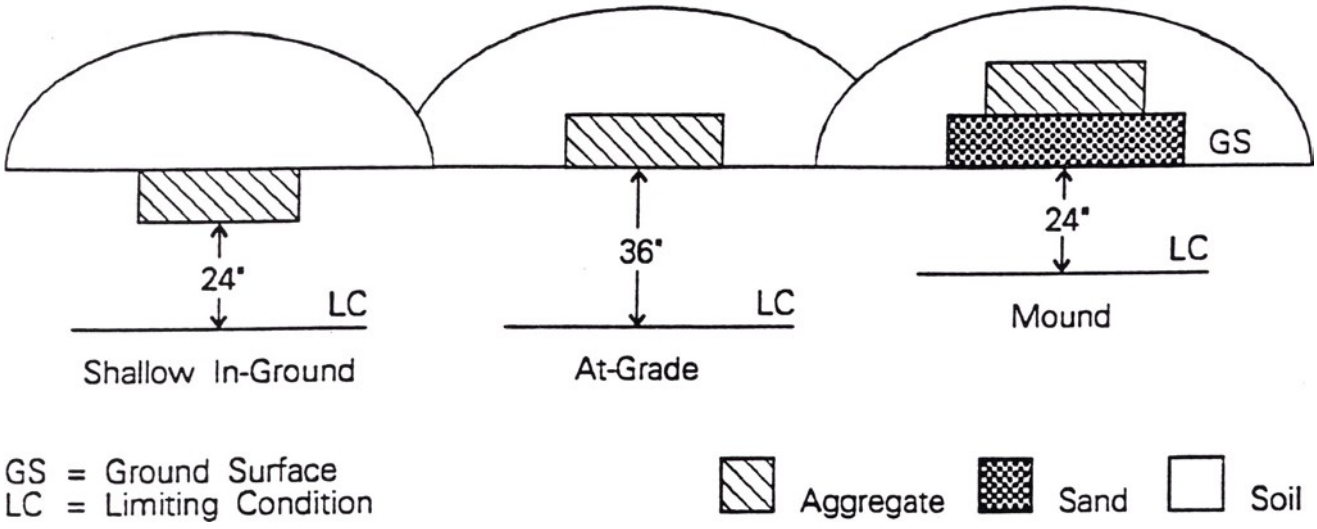
7. Performance wells shall be properly installed to provide easy access. See Figure 11.6 Performance Well Detail

8. Performance wells shall be a minimum of 24 inches below trench bottom.

13.4 At-Grade OWTS

A. The Wisconsin At-Grade soil absorption system accepts septic tank effluent and treats and disperses it in an environmentally acceptable manner. At-grade systems are designed to allow for reduced soil permeability and/or depth to groundwater conditions below the bottom of the system. It serves the same function as in-ground soil absorption trenches and mound systems. The At-grade component contains pressure distribution laterals installed on top of a gravel distribution media, which is installed directly on top of a plowed native soil. The system is then covered with a loam or a similar soil. Figure 13.4a is for illustration purposes only. Note that the diagram for the Shallow In-Ground would require the addition of an approved pretreatment unit to meet the three feet of soil below trench bottom requirement.

Figure 13.4a SIG (requires pretreatment), At-Grade, Mound Soil Below Trench Bottom Requirements



B. The minimum site criteria for At-grade OWTS. Permeable soil is required to a depth of 36 inches. Percolation testing done at 24 or 36 inches must meet the following criteria:

1. Percolation testing may also be required at 12 inches if this is the worst soil horizon encountered.

2. 1 - 120 mpi for At-Grade systems on slopes up to 25%. Note: A sand filter or

other approved pretreatment unit is required when percolation rates are faster than 5 mpi or slower than 90 mpi.

a. Rates faster than 1(one) mpi are not acceptable.

3. Separation from native grade to elevated groundwater is 36 inches, but may be reduced to 24 inches with the use of a sand filter or other acceptable pretreatment unit.

4. Minimum separation is 36 inches from fractured rock, rock exceeding 50% by volume, or bedrock as measured from native grade.

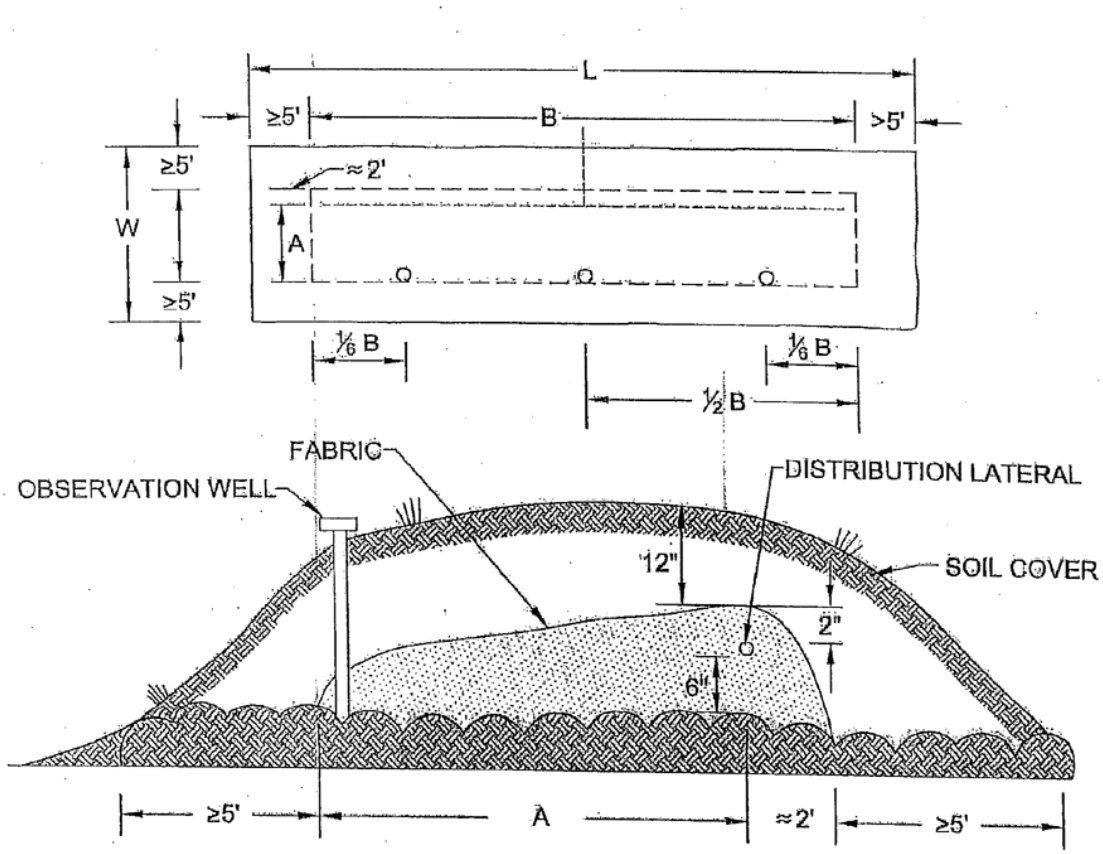
5. Placement of the At-Grade system in areas that require the removal of large trees, boulders, or rock outcroppings is not permitted.

C. The following **design criteria** shall be used for At-Grades in addition to the most current edition of the Wisconsin At-Grade Component Using Pressure Distribution Manual for Private On-Site Wastewater Treatment Systems.

1. Linear Loading Rate (LLR)

a. Designers shall estimate the LLR for all proposed At-Grade systems and shall design the width dimensions and gravel dimensions accordingly, so that the distribution bed is long and narrow and on contour (Refer to Figure 13.4b).
b. When the depth to a limiting condition (e.g. impermeable soil layer or rock is only 36 inches (or 24 inches with pretreatment) the LLR shall not exceed 4 gallons/linear foot/day [refer to Table 13.2a and Figure 13.2d.]
c. If it can be demonstrated that the wastewater flow will be vertical as well as horizontal, a higher LLR may be proposed.

Figure 13.4b At-Grade



PLAN VIEW AND CROSS SECTION OF WISCONSIN AT-GRADE UNIT WITH A SINGLE ABSORPTION AREA ON A SLOPING SITE

2. Soil Loading Rate

    a. The soil loading rate is to be based on the most restrictive soil horizon in contact with the distribution area. Use the percolation rate of the most restrictive soil horizon(s) and apply the corresponding sewage application rate (SAR) from Table 6.1.

3. Configuration (Refer to Figure 13.4b)

    a. The length of the gravel bed (B) shall be ≥ the design wastewater flow ÷ the LLR.
    b. The basal area shall be ≥ the design wastewater flow ÷ the SAR.
    c. The effective width of the gravel bed (A) shall be ≥ the design wastewater flow ÷ basal area length (B). In no instance shall the width of the distribution bed below and downslope of the lateral exceed 15 feet.
    d. Absorption bed depth

        i. There shall be a minimum of 6 inches of gravel below the distribution pile for residential systems with 2 inches of gravel cover over the pipe.
        ii. There shall be a minimum of 9 inches of gravel below the distribution pile for commercial systems with 3 inches of gravel cover over the pipe.

    e. Only single distribution beds are acceptable. Dual beds are not allowed.
    f. The gravel bed shall extend at least 2 feet above the uppermost distribution pipe lateral.

4. Aggregate

    a. 3/8 double washed pea gravel size to 2 inch double washed drain rock
    b. The percentage of fines of washed gravel shall not exceed 1% by weight.

5. Natural Contour

    a. The distribution bed shall explicitly follow the natural contour of the ground. The bed must be installed within a tolerance of 0.25 feet (3 inches) vertically per 100 feet horizontally.
    b. Distribution beds shall be angled or curved to meet this requirement.
    c. The distribution bed shall not be placed in a concave landscape position. See Figure 13.4b.

6. Reserve Expansion Area

   a. On parcels created before October 1971, a 100% reserve area is required.
   b. For commercial systems and parcels created after October 1971, a 200% reserve area is required.

7. Soil Cover

   a. A geo-textile synthetic fabric (Mirafi 140 N or equivalent) is to be placed over the aggregate bed.
   b. 12 inches of soil covering after settling is to be placed over all aggregate. Additional depth of topsoil must be placed during the time of construction to assure that the minimum depth is achieved following natural settling of the soil.
   c. Soil cover shall extend a minimum of 5 feet uphill and on both side of the gravel bed. Downslope soil cover shall conform to Table 13.4a.

Table 13.4a At Grade Downhill Soil Cover Requirements

SLOPE	COVER (lineal feet beyond gravel)
0-2%	4
2-4%	6
4-6%	8
6-8%	10
8-12%	12
12-16%	16
>16%	20

8. Distribution System

   a. Total Dynamic Head Loss. Designers shall calculate the total dynamic head loss of the entire distribution system.

      i. Vertical differences
      ii. Length of entire piping system
      iii. Loss of all valves, tees, elbows and appurtenances
      iv. Head loss shall be referenced in feet of elevation
      v. Distribution piping shall be Schedule 40 PVC or greater of at least three-

quarter (3/4) inch diameter

vi. Hydraulic orifice discharge shall be a minimum of 60 inches for upward discharge. Orifices shall have a protective shield.

vii. Orifice spacing shall be a maximum of 36 inches on center (Closer spacing is preferred)/

viii. Size of orifices shall be 1/8”-3/16”.

b. Balancing Valves and Purge Valves. System distribution manifolds shall have a balancing valve at the beginning of each pressurized line and a purge valve at the end.

i. All valves shall be protected and encased within plastic, concrete or other approved type box to provide easy access and maintenance. Metallic valves are prohibited.

ii. Box size shall be 10 inches across or larger, round or square, and must allow room for maintenance and/or to install stand pipes onto the ends of the purge valves.

iii. Balancing and purge valves shall be PVC Schedule 80 gate or ball type valves.

c. Perforated Pressurized Lines.

i. One or two pressurized lines may be used in the At-Grade bed with the goal being to provide maximum distribution of wastewater along the length of the At-Grade. Where 2 lines are used, the distance between the lines shall be 24 inches.

ii. The maximum length of pressurized lines shall be 75 feet.

iii. The maximum distance between perforations shall be 36 inches. Where 2 pressurized lines are used the holes shall be staggered between the 2 lines.

iv. Hydraulic orifice discharge shall be a minimum of 60 inches for upward discharge. Orifices shall have a protective shield

9. Sump and Pump. Refer to Sections 8.3 and 8.4 for required sump and pump features. Note Automatic dosing siphons are NOT allowed in At-Grade sewage dispersal systems.

10. Sizing formulas for At-Grade systems. Sizing calculations for all At-Grade dimensions shall be provided with all proposals.

D. The construction criteria for At-Grade OWTS includes the following

1. The use of wheel type vehicles is prohibited.

a. For the purpose of ripping
b. When driving on any areas that have been ripped.
c. When placing or moving the soil cover.
d. At any time that the soil conditions are wet, moist, or saturated.

2. Placement of the pressurized transmission line from the sump tank to the At-Grade manifold shall be a minimum of 24 inches below the surface of the ground.

3. Site preparation of soil surface to a depth of 8 to 12 inches.

    a. Mow excessive vegetation

        i. Remove tress
        ii. Cut and grind stumps to a depth of 12 inches.
        iii. Perform initial ripping parallel to the contours of the ground and only within the limits of the gravel base; rippers set 8 to 10 inches apart. The interface of the native soil and the At Grade soil shall be ripped after the gravel has been placed and just prior to placement of the At-Grade soil cover.
        iv. Prohibit all traffic on any ripped surfaces until the full depth of gravel bed or cover material has been placed.

4. Gravel bed

    a. Temporary form boards are required to hold aggregate in place to construct the gravel bed.
    b. The temporary form boards shall be removed prior to placement of the soil cover.
    c. Place performance wells as specified in Section 13.4E
    d. Place aggregate in the designated tilled area to the appropriate depth as specified in D.2
        (3) above. Work from the upslope side and avoid compaction along the downslope side.

5. Construct distribution network prior to cover placement

6. Perform hydraulic test after the distribution has been completed.

    a. Pump must be adequate to provide hydraulic orifice discharge of a minimum of 60 inches upward discharge. Orifices shall have a protective shield.

b. Distribution to all laterals shall be equal.
c. This test shall be inspected by the consultant and the Permit Authority.

7. Place soil cover

a. Place 2 inches (residential) or 3 inches (commercial) aggregate over the distribution network.
b. Place geo-textile fabric over the aggregate. Extend only to the edge of the aggregate.
c. Condition soil cover with sufficient moisture to permit track rolling to a firm cohesive surface.
d. Rip area to be covered with cover soil.
e. Place soil against the form boards by track rolling only. Remove the form boards.
f. Place soil over entire gravel bed by track rolling and grooming by hand. Complete proper drainage work and erosion control measures before final inspection. Seed and mulch.

8. Establish the final grade of the At-Grade by track rolling and grooming by hand.

9. Install performance wells and details as shown on the plans.

E. The performance well criteria for at-grade OWTS include the following

1. A minimum of five performance wells shall be installed within and around the system.

a. One performance well shall be installed 10 feet upslope of the upslope gravel bed at the system centerline for sloping sites. The well depth shall be 36 inches below original grade. If the system was designed for 24 inches of soil and utilizing a pretreatment unit, the well depths shall be 24 inches below original grade.
b. Two performance wells shall be installed 25 feet down slope of the gravel toe at-grade at proportionate locations from the centerline. The well depths shall be 36 inches below original grade. If the system was designed for 24 inches of soil and utilizing a pretreatment unit, the well depths shall be 24 inches below original grade.
c. If the hydraulic gradient cannot be determined on flat sites, two performance wells will be required on each side of the system installed 25 feet from the gravel toe at proportionate locations from centerline. The well depths shall be 36 inches below original grade or 24 inches below original grade if a pretreatment unit was utilized.
d. Two performance wells shall be installed at the down slope toe of the

gravel bed at proportionate locations from centerline at a depth of 24 inches. The depth of these performance wells shall extend to the gravel soil interface. The slotted/screen casing of the well shall extend through the entire depth of the gravel and the gravel (instead of sand) shall be placed in the annulus between the casing and the borehole. For long systems, at least one performance well shall be installed in each 75 feet of lateral. See Figure 11.6.

13.5 Shallow in Ground (SIG) OWTS

A. Shallow In-Ground Systems (SIG) utilize shallow depth trenches and pressure distribution methods of disbursal of effluent.

1. SIG systems are designed with the acceptable fill material as soil cover.

2. The fill or soil cover is placed in a manner similar to the ~~PRMD~~ Permit Authority requirements for Filled Land systems.

3. SIG systems are designed for sites that typically have shallow top-soils over slowly permeable or fractured subsoils on slopes up to 25%.

B. The site criteria for SIG OWTS includes the following

1. Percolation rate of 1 - 120 mpi for systems on slopes up to 25%.

2. Percolation rates faster than 1 mpi are unacceptable.

3. Percolation tests shall be at trench depth and at two and three feet below the trench depth, if necessary after soil profile review.

4. Visual field observations and soil texturing to identify any limiting conditions.

   a. Systems shall have a minimum depth of 36 inches of suitable soil beneath trench bottom and 36 inches from trench bottom to groundwater. These may be reduced to 24 inches if an approved pretreatment is used.
   b. The rock content (as retained in the #10 Sieve) shall not exceed 50% by volume within the first 24 inches of soil below trench bottom.
   c. Soils hydrometer and bulk density tests (Zone 1 or Zone 2 soils).
   d. Plasticity Index test results <20 for Zone 3 or 4 soils (ASTM D-4318-84 Atterburg Series).

5. System sizing shall be based upon soil morphology and average percolation rate, if that results in larger system. Refer to Sonoma County Percolation Test and Sizing Chart for non-standard systems recommended sizing.

6. Systems shall have a minimum separation of 36 inches to groundwater, fractured or impermeable soils beneath trench bottom and 48 inches to bedrock as measured beneath proposed trench bottom. Note that minimum separation may be reduced to 24 inches below trench bottom if acceptable pretreatment is used.

7. To maximize evapotranspiration pressure distribution systems as the SIG may not be installed below non-permeable soils such as high shrink-swell clays, highly compacted soils, and/or soils with massive or platy structures.

8. See Sections 12.1and 12.2 and Table 7.2c for restrictions on use and other required setbacks.

9. Soil cover of 12 inches minimum is required.

C. The design criteria for SIG OWTS includes the following

1. See Section 13.3C Design Criteria for Pressure Distribution Systems.

    a. Refer also to the following standards.

        i. Permit Authority regulations for Filled Land Systems.
        ii. Permit Authority Mound Construction Regulations.

2. Trench Spacing

    a. Minimum of 8 feet on center for 0 to 12 ½% slope.
    b. Minimum of 10 feet on center for 12 ½ to 20 % slope.

3. Sand filter or other approved Pre-treatment units are required on sites with percolation rates faster than 5 mpi or slower than 90 mpi.

4. A dual system with an approved diversion valve shall be designed and installed for SIG systems.

D. The construction criteria for SIG OWTS includes the following

1. See Section 13.3D Construction Requirements for Pressure Distribution Systems.

E. The performance well criteria for SIG OWTS includes the following

1. See Section 13.3E Performance wells for Pressure Distribution Systems

13.6 Bottomless Sand Filter OWTS (Geographic Waiver)

A. A bottomless sand filter is a special case of an above grade gravel and sand-lined drain field. The process requires intermittent application of wastewater that allows an unsaturated downward flow through a filter media of an ASTM C-33 sand. The purpose of the sand filter is to pretreat the effluent and improve wastewater quality. The use of bottomless sand filters are adequate to allow substantial repairs and renovations to existing residences, provided there is no increase in the volume of sewage discharged.

B. The site criteria for bottomless sand filter OWTS includes the following

1. The sand filter will serve an existing structure located on the 100 year flood plain; and

2. The sand filter will be located at least 100 feet from the summertime banks of the waterway; and

3. The sand filter will be located on deep, well drained soils without elevated winter time water table levels and will meet all other setback requirements.

4. Under these conditions, a reduction or elimination of replacement area may be permissible.

C. The design criteria for bottomless sand filter OWTS includes the following

1. The design of bottomless sand filters is based on the April, 1999 Washington State Department of Health publication “Sand Lined Trench Systems.”

2. A support structure shall

    a. be designed and built so that the top of the liner is at least six inches above natural grade.
    b. on sloping sites a surface water diversion must be excavated upslope of the sand filter at the top of the sand filter backfill material.
    c. the containment vessel must be designed by a qualified engineer and have a support foundation to prevent vertical and horizontal movement of the vessel.

3. The bottomless sand filter must be installed into a minimum of 6 inches of native undisturbed soils and consist of the following components

    a. 24 inches of ASTM C-33 sand filter media, as determined by ASTM D-136 and C-177.
    b. A distribution bed consisting of 6 to 12 inches of gravel bed with pipe.
    c. An approved geo-textile followed by 6-12 inches of earth backfill.

4. Effluent distribution from the sump to the sand filter shall be

    a. Pressure transport. Manifold, lateral piping and fittings must be at minimum Schedule 40 PVC.
    b. Pressure transport piping shall be solvent welded. All joints in the manifold piping, lateral piping, and fittings must be solvent welded and watertight.
    c. A gate valve and check valve must be placed on the pressure transport pipe, in or near the sump tank, as appropriate.
    d. Pressure lateral distribution piping and fittings must be a minimum of 1inch in diameter.
    e. Pressure manifold and transport piping must be a minimum of 2 inches in diameter.
    f. Hydraulic orifice discharge shall be a minimum of 60 inches for upward discharge. Orifices shall have a protective shield.
    g. Orifices must have a minimum 1/8 inch diameter and be placed a maximum distance of 30 inches apart.
    h. Ends of the lateral distribution piping must be connected with a blow off riser for cleaning and inspecting. The riser shall extend to the ground surface and have a threaded cap.
    i. The distribution lateral shall have 6”-12” of gravel beneath the pipe (residential and commercial respectively), 2 inches of gravel above the pipe and be covered with an approved geo-textile filter prior to placement of 6-12 inches of soil cover.

j. The Sand Filter maximum dosage is 90 gallons per cycle. Electronic timed meters are preferred over float (on demand) type controls.
k. The minimum setback requirements for bottomless sand filters are the same as those required for septic tanks.

D. The construction criteria for bottomless sand filter OWTS includes the following

1. Wooden containment vessels shall be constructed of pressure treated or redwood heart grade materials.

2. The sides of the above ground containment vessels shall be lined with a minimum thickness 30 mil PVC membrane liner.

3. The liner must extend up the sides of the support structure with enough excess to allow the liner to be firmly anchored.

4. All seams shall be factory heated or solvent welded.

5. A factory fabricated boot where the pressure line passes through the liner is required. The boot must extend into the box. All fittings must extend into the liner and be watertight.

6. Use of a non-woven needle punched synthetic geo-textile fabric in a thickness appropriate to protect the liner is required.

7. Both the filter media surface and the sand-original soil interface must be level.

E. The performance well criteria for bottomless sand filter OWTS includes the following

1. One or more performance well(s) shall be installed 10 feet upslope of the sand filter to a depth of 24 inches below grade.

2. One or more performance well(s) shall be installed 10 feet down slope of the sand filter to a depth of 24 inches below grade.

3. If the hydraulic gradient cannot be determined on flat sites, performance wells will be required on each side of the sand filter. One well shall be installed 25 feet upslope and one well installed 25 feet down slope of the sand filter. The depths of the wells shall be a minimum of 24 inches below grade.

4. On sloping sites, one or more performance wells shall be installed 25 feet down slope of the sand filter to a depth of 24 inches below grade.

5. One or more performance well(s) shall be installed in the sand filter to a depth

of the upper gravel and sand interface.

6. One or more performance well(s) shall be installed in the sand filter to a depth of the lower sand and gravel interface. See Figure 11.6.

13.7 Subsurface Drip Dispersal OWTS

A. A subsurface drip dispersal OWTS is a pressurized wastewater distribution system that delivers small, precise doses of effluent to shallow subsurface dispersal/reuse fields. The distribution piping is small diameter flexible polyethylene tubing (dripline) with small in-line emitters that discharge effluent at slow controlled rates. A typical subsurface drip dispersal system installation includes a septic tank, supplemental treatment, a dosing chamber, pump(s), control panel, timed dosing and supply and return flow monitoring, particulate filter, filter backwashing and drip line flushing, driplines, and monitoring wells. A supplemental treatment system that reduces effluent strength to the Section 13.1 Pretreatment Units quality standards is required.

B. The site criteria for subsurface drip dispersal OWTS includes the following

1. Depth to a limiting condition and permeable soils (1-120 mpi) below the drip line bottom shall be a minimum of 24 inches.

2. The soil above the drip line proposed depth shall be permeable (1-120 mpi). This excludes massive or platy structured soils. Soils subject to flooding, excessive irrigation, farming practices, grading, ripping or roto-tilling are also not acceptable. The quality of acceptable soils above the dripline shall be equal to those below the dripline.

3. A minimum of 24 inches of permeable soil below emitter depth shall extend a horizontal distance of no less than 25 feet down gradient from the edge of the last proposed drip line, including expansion areas.

4. Subsurface drip irrigation system sites shall not exceed thirty (30) percent slope without an approved variance and a geotechnical study required for slope stability and suitability.

5. Subsurface drip irrigation system sites shall not exceed twenty (20%) percent slope when fill is placed over the drip system without an approved variance and a geotechnical study required for slope stability and suitability.

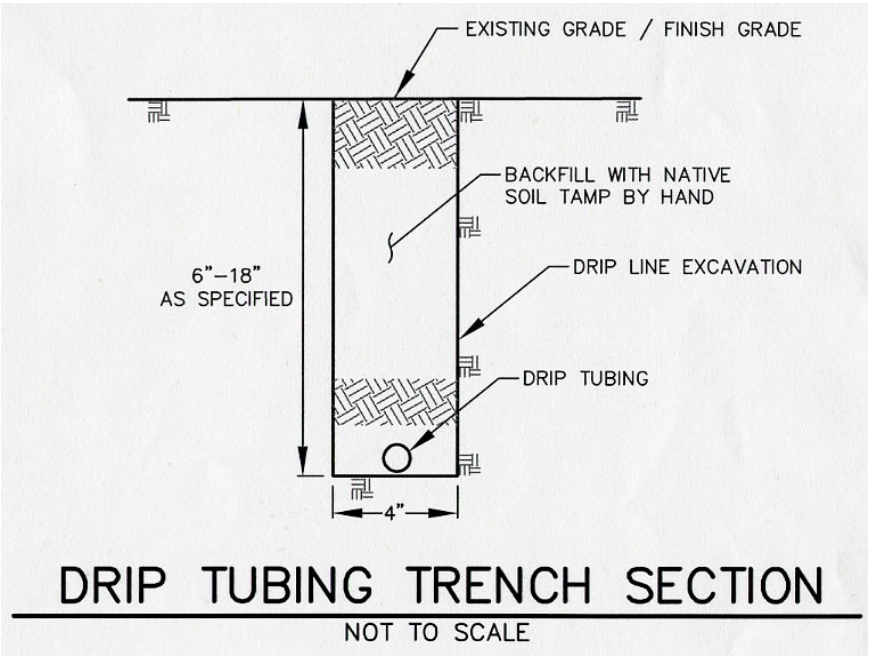
C. The design criteria for subsurface drip dispersal OWTS includes the following

1. Separation between emitter line laterals shall be a minimum of two (2) feet.

2. Dripline installations generally have emitters spaced 24 inches apart maximum and 12 inches minimum.

3. A standard drip system is typically installed 12 inches into native soil. A minimum native soil depth of 6 inches may be allowed with disinfection. The maximum soil cover allowed is 18 inches. (See Figure 13.7a).

Figure 13.7a Drip Trench Cross-Section



4. Soil application rates generally assume each emitter will wet an area of four square feet. However, this assumption is not valid in all soil types because the size of the wetted volume depends on soil characteristics and dosing cycles. Sizing of the subsurface drip dispersal system shall be based on both soil morphology and the percolation rate at the most restrictive horizon (See Table 7.2a for percolation rates). Designers shall clearly demonstrate the minimal square footage required as determined by the soil morphology and percolation rate. Perc tests may be waived for developed parcels in some circumstances.

5. The designer shall also determine the number of zones, the number of doses, the quantity of the dose, the head losses, spacing of drip lines, spacing of drip emitters, diameter of the drip tubing (typically 0.55" ID), pump size, location of air relief valves and the "frequency of flushes."

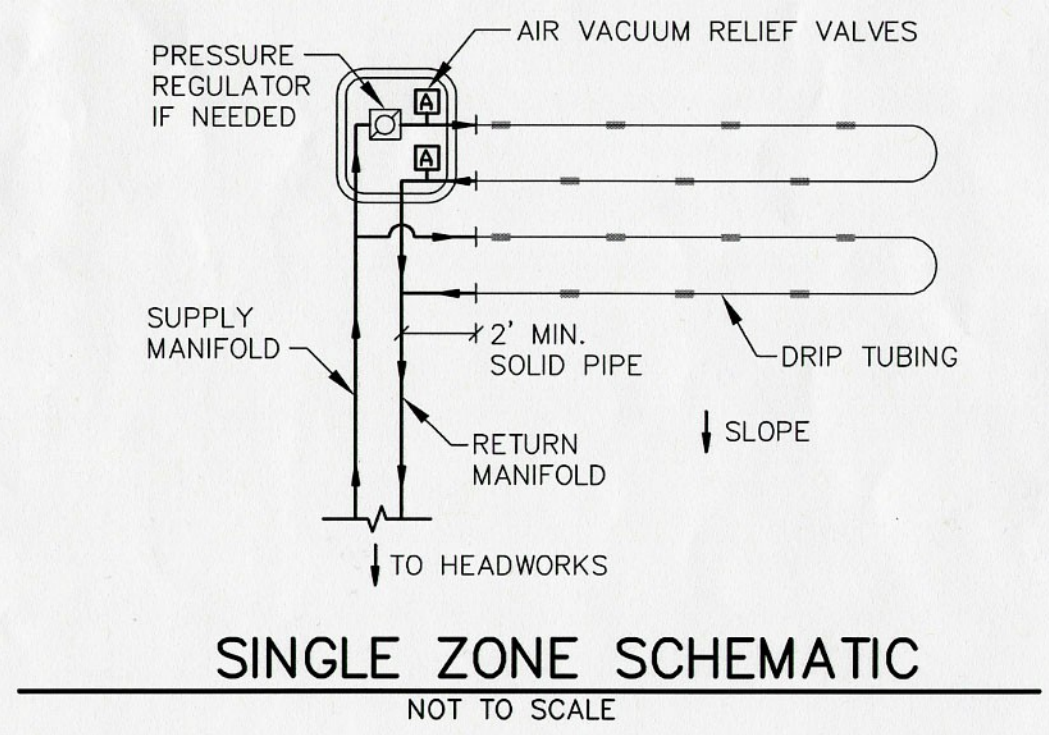
6. Distribution zones shall be designed to be consistent with dripline manufacturer

requirements. The length of each distribution line shall not exceed manufacturer's specifications to insure equal distribution to each emitter. If multiple zones are designed, dosing must be automatically alternated between each zone.

7. All subsurface drip dispersal systems require an approved supplemental treatment unit for treating septic effluent and mechanical filtration with Vortex/Spin Filters or Disk Filters. The level of supplemental treatment must comply with NSF Standard 40 or to the satisfaction of the administrative authority, Section 13.1 (Pretreatment Units) or as specified by the manufacturer, whichever results in most improved effluent quality. Different subsurface drip dispersal products may require different levels of supplemental treatment.

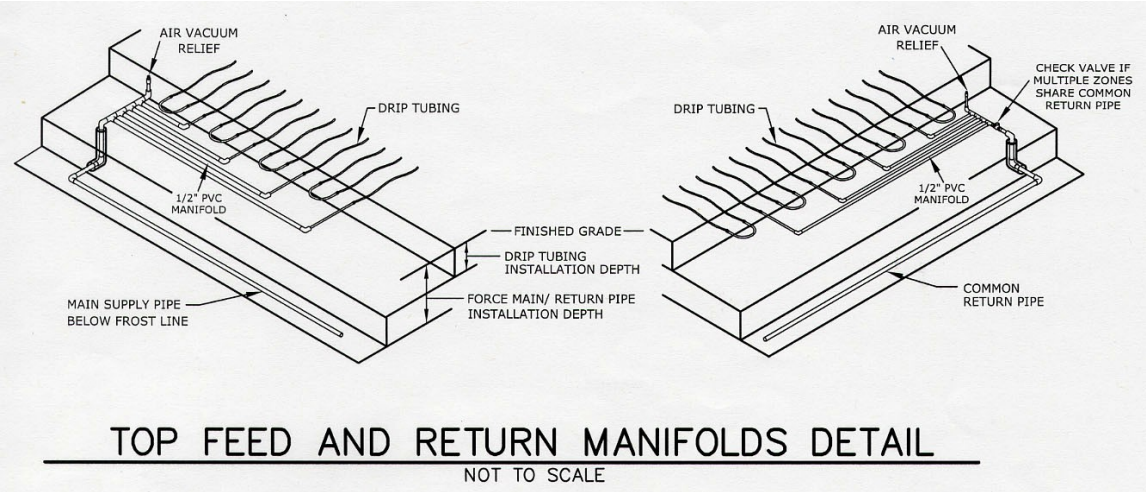
8. Drip systems are "closed loop" networks with control valves and supply/return manifolds to allow for periodic line flushing (See Figure 13.7b). Required flushing velocity shall be a minimum of 1 foot/second.

Figure 13.7b Single Zone Schematic



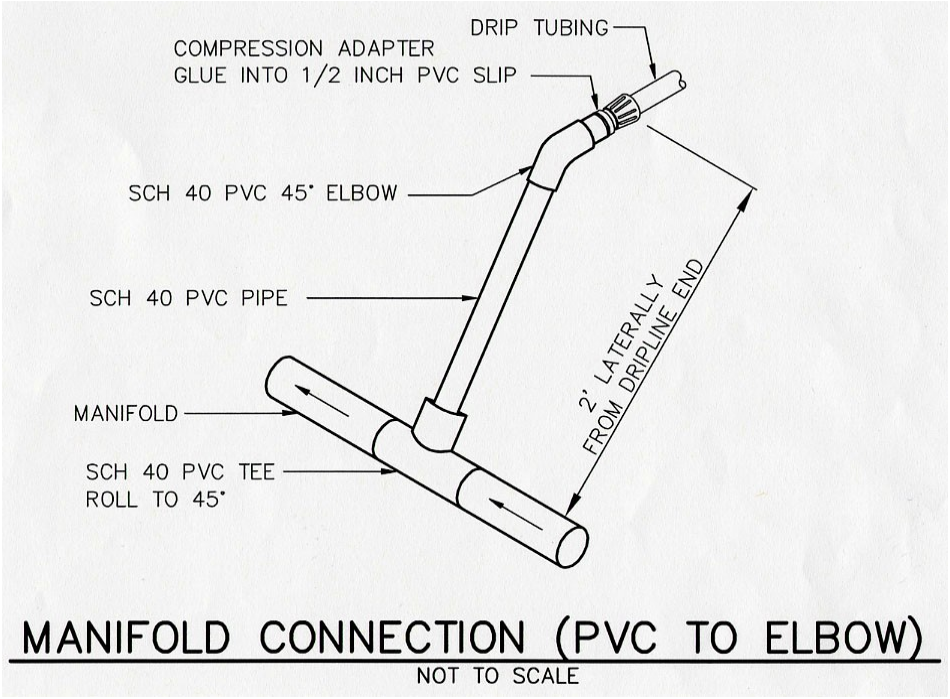
9. Designer shall employ measures to prevent uneven distribution of the dispersal field due to drain down following a pump cycle. Per California Plumbing Code, spring check valves are not allowed for wastewater applications. (See Figure 13.7c for example of a top feed manifold

Figure 13.7c Top Feed Manifold



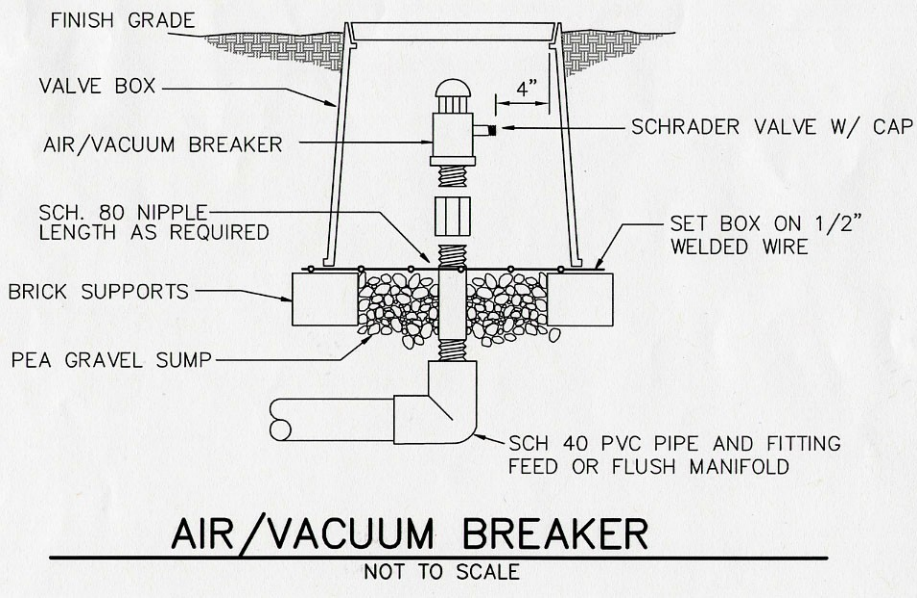
10. Provide 2 feet of solid tubing/pipe between the manifold and the drip tubing (See Figure 12.7d).

Figure 13.7d Manifold Connection



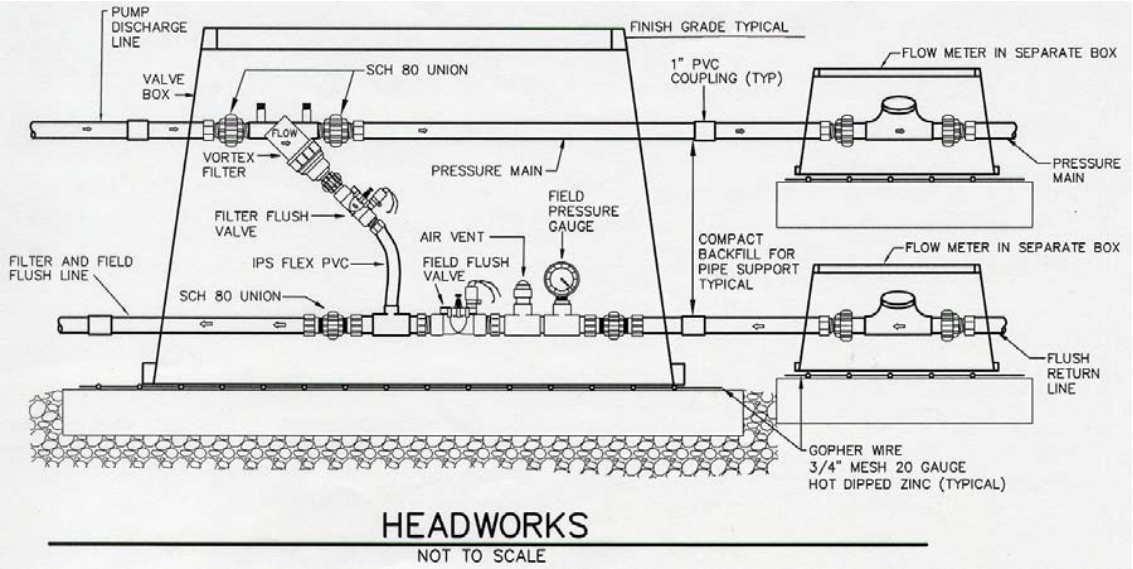
11. Air/vacuum release helps prevent soil particles from being sucked into emitters and is required on all drip systems. Air/vacuum release valve(s) must be installed at the high point of each distribution sector of the supply and return manifold. The air relief valves shall be equipped with Schrader valves in order to check pressure. These valves must be located in valve boxes with adequate room to attach a pressure gauge (See Figure 12.7e).

Figure 13.7e Air Relief with Schrader Valve



12. All system components (filters, control valves, air-vacuum relief valves, pressure regulators and controllers) shall be appropriately sized for the system dosing and flushing flow rates, and shall meet specifications of the drip line manufacturer (See Figure 13.7f for example of headworks). All transport piping, supply and return manifolds and fittings must be Schedule 40 PVC or Schedule 80 PVC if threaded fittings are utilized. All filters must be sized to operate at a flow rate greater than or equal to the maximum design discharge rate of the system including the field flush cycle.

Figure 13.7f Headworks



13. Filter backwash and line flushing debris must be returned to the septic tank or into the sump chamber.

14. Totalizing flow meters (in gallons) are required on the supply and return distribution lines. Flow meters must be installed in a readily accessible location for reading and servicing.

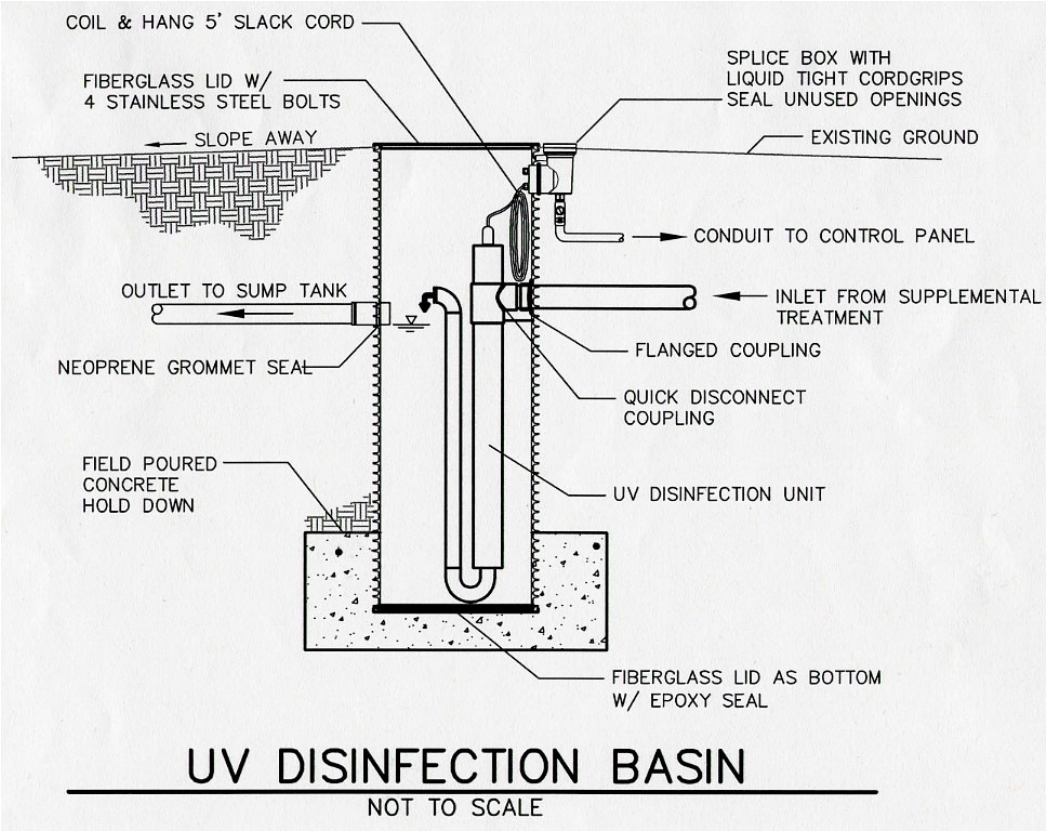
15. A controller capable of timed dosing and automatic line/filter flushing is required.

16. Disinfection of the treated wastewater shall be incorporated in cases of well-drained soils (<1 mpi or faster) or where drip dispersal systems only have a minimum of 6 inches of native soil cover above the drip line (see Figure 13.7g). If 6 inches of approved fill is added above the 6 inches of native soil cover, disinfection will not be required.

17. On parcels created before October 1971, a 100% reserve area is required. For commercial systems and parcels created after October 1971, a 200% reserve area is required.

18. For aerobic treatment unit (ATU) systems that function with external blowers, a cutoff switch or interlock that disables the pump must be built into the control panel so the blower may not be disconnected.

Figure 13.7g Disinfection Unit



D. The construction criteria for subsurface drip dispersal OWTS includes the following

1. Dripline can be trenched (by hand or with a trenching machine) into narrow, shallow trenches or plowed directly into the soil (with a vibratory plow or other insertion tool) and backfilled without gravel or geotextile.

2. To the extent possible, systems should be designed for the dripline lateral to follow the contour. However, whenever drip lines cannot follow the contour, distribution network driplines with Pressure Compensating (PC) emitters shall be installed in grid patterns to accommodate irregularly shaped sites or landscape irrigation applications.

3. Valves must be readily accessible for service and/or inspection. All valve boxes must be protected from gopher soil movement. A detail of the valve box must be included on the plans. Specify concrete, hardware wire or similar bottom.

4. A ground cover (turf, fruit trees or other appropriate landscaping) must be planted over the dripfield after installation to provide additional treatment, prevent erosion and increase wastewater reuse through plant evapotranspiration.

5. Fill material may only be placed above native soil for soil cover, and shall not be used to meet required soil depth minimums. The system designer shall describe the type of fill to be placed in terms of texture and structure, the depth and method of ripping before placement. No part of the subsurface drip dispersal field may be located where the site slope exceeds twenty (20) percent when fill is used.

6. Owners should avoid activities that might damage the drip tubing or compact the soil.

7. After the #189 septic electrical inspection has been completed by the Building Inspector, a startup inspection must be scheduled with the system designer, installer, service provider and the Permit Authority.

E. The performance well criteria for subsurface drip dispersal OWTS includes the following

1. A minimum of four performance wells shall be installed around the drip dispersal field.

    a. One performance well shall be located 10 feet upslope of the system to a minimum depth of 24 inches below the drip line depths.
    b. One of more performance wells shall be located 10 feet down slope of the system to a minimum depth of 24 inches below the drip line depths.
    c. Two performance wells shall be located 25 feet down slope of the system to a minimum depth of 24 inches below the drip line depths. See Figure 11.6.

Section 14 Non Standard and/or Commercial OWTS Operational Permit and Monitoring

A. All non-standard OWTS and commercial OWTS that meet applicable criteria of Sections 11 (Commercial), 12 (Experimental) or 13 (Alternative) OWTS criteria require the issuance and possession of valid Operational Permits pursuant to Sonoma County Code Sections 24-33 and 34 (see Appendix C).

1. Applications to construct non-standard OWTS must be accompanied by applications and fees for operational permits.

2. Operational permits are transferable subject to an ownership transfer fee.

3. An Operational Permit Easement Deed and Agreement is needed for the Easement property serving the residence or business.

4. A separate Easement Agreement to an Operational Permit OWTS Easement Agreement is required whenever a portion of the non-standard OWTS is located on a different parcel.

    a. If a property changes ownership within sixty (60) days of the issuance of the original Operational Permit, the permit may be transferred without additional fees. The anniversary date shall remain as per permit originally issued.

B. A recorded easement agreement is required for all OWTS subject to this Section. The purpose of easement agreements is to allow the associates and employees of PRMD and/or the RWQCB onto the properties to monitor and test the non-standard OWTS.

1. Primary and reserve test areas for non-standard OWTS are required to have the standard easement agreement recorded against the parcel before issuance of the sewage dispersal permit.

2. Easement agreements may not be removed from the title of the property unless authorized in writing by PRMD.

C. Monitoring forms will be provided by the PRMD to the property owner two times per year for recording information regarding OWTS operation.

1. Property owners shall complete the monitoring reports and submit them to

PRMD within thirty days of receipt.

2. Failure to perform the self-monitoring program is cause for suspension of the Operational Permit.

3. Failure to provide access to the system area when requests for access have been communicated to the property owner is cause for revocation.

D. All Experimental or Alternative Non-Standard OWTS that include an approved Pretreatment Unit, permitted on or after the effective date of this OWTS manual are subject to inspection, maintenance and monitoring by an approved Service Provider for the life of the system. An approved Service Provider means a Registered Civil Engineer, Registered Environmental Health Specialist, or any person who is licensed as a certified on-site wastewater system inspector or other equivalent license by passing a state or nationally accredited test.

1. All Non-Standard OWTS permitted prior to the effective date of this OWTS manual will have the option of being permitted with an approved Service Provider, or remain as they are currently permitted.

2. A copy of a signed contract with the approved Service Provider, if applicable, a completed maintenance and monitoring inspection report shall be submitted to the Department with any application for a change of ownership.

3. Once a Service Provider is hired or upon change of ownership, the Non-Standard OWTS with a Pretreatment Unit will be required to have a Service Provider for the remaining life of the system.

4. All non-standard systems with TCOM/VCOM panels must have a qualified Service Provider for the life of the system.

E. All non-standard OWTS must be designed with a series of performance wells to sample for potential subsurface groundwater degradation. Performance wells are strategically placed up gradient, laterally, down gradient and within most non-standard OWTS.

F. PRMD may occasionally sample performance wells for total coliform bacteria, fecal coliform bacteria, and nitrates as indicators of the degree of sewage treatment and function of non- standard OWTS. The following are limits of maximum contaminant levels to analyze degree and function of nonstandard sewage dispersal systems.

G. Any non-standard OWTS that causes sewage to surface or discharge at ground level or any tank exfiltrating wastewater or infiltrating groundwater is deemed to have an adverse effect on surface water and is considered a public health hazard. It is defined as a failing OWTS. Such a system shall be immediately corrected or abated.

1. Sample results greater than 240,000 M.P.N. (most probable number) total coliform bacteria and/or a fecal coliform count greater than 2.2 M.P.N. exceeds the maximum contaminant levels and is deemed to have an adverse effect on subsurface water.

   a. Such level of contamination as sampled from any purged performance well located 25 feet or greater down gradient from the dispersal field indicates a failing system.
   b. Failing systems shall be corrected or abated.

2. Sample results exceeding 3,000 M.P.N. but less than 240,000 M.P.N. total coliform and/or less than 2.2 M.P.N. fecal coliform, do not exceed the maximum contaminant levels. However, these results define a non-standard OWTS as operating marginally.

   a. The contaminant levels are results of samples that have been taken from any purged monitoring well located 25 feet down gradient from the dispersal field.
   b. For the purpose of the Annual Monitoring Report, OWTS that show ponding of effluent within 12 inches of trench bottom (but do not exceed M.C.L.'s mentioned above) are defined as operating marginally.

H. PRMD is required by the RWQCB to monitor the operation and maintenance of all non- standard OWTS.

1. Inspection frequency may vary but is generally based upon a frequency of one inspection per year.

   a. PRMD shall submit results of the monitoring inspections to the RWQCB in the form of an annual report for each calendar year.
   b. PRMD shall notify the RWQCB in writing whenever the monitoring program is inadequately staffed.

Section 15 Vesting Certificates

15.1 General

A. The issuance of vesting certificates for approved OWTS plans and/or installed OWTS are intended to protect property owners from any potential future changes in OWTS regulations, during the effective term of the vesting certificate. Pursuant to Sonoma County Code Chapters 24-56 & 57 and 7-12 (Appendix C), the design and/or installed system must be in conformance with current codes and standards in effect at the time of vesting certificate approval, including proof of water in water scarce and marginal water areas (second dwelling units only).

15.2 Limitations

A. Vesting certificates for approved OWTS designs are valid for three (3) years from the date the vesting certificate is signed. Upon submission of a complete OWTS permit application within the three years, an OWTS permit shall be issued in accordance with the approved plans. Prior to permit issuance, a site visit shall be made to determine that no changes have occurred which may cause revocation of the vesting certificate.

B. Vesting certificates for installed OWTS are valid for two (2) years from the date the vesting certificate is signed.

C. Upon proper application for a Well & Septic Clearance for the residence within that time period, the clearance will be approved, provided the proposed dwelling does not exceed the design capacity of the OWTS and does not conflict with required setbacks to any feature of the OWTS.

15.3 Restrictions

A. Experimental systems and/or those systems subject to Waste Discharge Requirements (WDRs) from the Regional Water Quality Control Board are not eligible for vesting certification. Vesting certificates for OWTS subject to WDRs may be eligible if WDRs are waived by the Regional Water Quality Control Board.

15.4 Revocation

A. Vesting Certificates can be revoked in the following cases

1. It is found to have been based upon false or erroneous data.

2. Excavation, grading, or compaction of soils has occurred which would render the approved leach field area or expansion area unsuitable for a septic system.

3. The Regional Water Quality Control Board adopts a prohibition against waste discharges.

4. Further information shows that the proposed installation would create a gross public health hazard.

B. Alteration of Ambient Conditions

1. Construction of wells, waterways, cut banks, or roads have occurred that would affect the area's use for the leach field or reserve expansion area.

2 .The County cannot deny a permit for a well within 100 feet of a vested area unless the septic system has actually been installed or a septic system permit issued.

Section 16 Subdivisions and Lot Line Adjustment Requirements

A. No approval of an application for a minor subdivision or lot line adjustment which necessitates use of sewage easements shall be granted. Each proposed lot must be demonstrated to have a site suitable for installation and expansion of an OWTS contained entirely within the proposed property lines of the lot.

B. Sewage easements for major subdivisions may be considered under the following circumstances

1. A homeowner's association or other entity of dischargers empowered to conduct a program of regular sewage system monitoring, maintenance, and repair is created.

2. Easements are contained only within common lands of the subdivision.

3. Common areas are owned and controlled by the entity.

4. The easement for each lot is entirely separate and distinct from the easement for any other lot.

5. Use of easements is not used as a basis to allow lot sizes smaller than those specified in the County Subdivision Ordinance for lots with OWTS.

6. New applications for construction or repair of an OWTS shall be in accordance with these requirements.

7. The Project Review Specialist - Health shall be responsible for implementing regulations relative to subdivisions and lot line adjustments.

Section 17 Variance Requirements

A. Requests for variances of State and/or County regulations may be granted only when the Director of the Permit Authority, or his/her designee, determines that the requested variance is consistent with the minimum standards for public health and water quality protection. Any variance request must provide a corresponding mitigation measure(s) or justification to assure that public health and water quality protection at least equal to that established by the rules, is provided.

B. Variances shall be considered only if no other reasonable alternative exists on the property.

C. The Permit Authority shall review the variance request(s) for a site development, evaluating the proposed variance mitigation measure(s) for consistency with the public health/water quality protection intent of the OWTS standards.

D. Variances cannot be approved for the prohibitions listed in section 4.2.C unless there is a corresponding mitigation measures listed in section 4.3.

E. Variance Justification. The variance justification shall include the following:

1. The special circumstances affecting the property that make the strict application of the standards impractical.

2. The standard proposed to be varied.

3. The proposed substitute measure.

4. How the substitute measure achieves the same intent or goal as the standard being varied.

5. The soil type, according to the USDA Sonoma County Soil Survey.

6. Soil profile logs.

7. Preliminary OWTS design

F. Typical variance items and approved mitigation measures approved are shown in Table 17.

G. Variance requests for undeveloped parcels and upgrades to existing OWTS that would result in a potential increase in flow are prohibited in areas identified in Section 18.

Table 17 Minimum Requirements for Variance Requests

Variance Specific Item	Approved Mitigation Measure
Slopes >30% (section 4.2.C.4)	1. Subsurface drip dispersal or shallow trench pressure distribution OWTS only 2. Drip/leach lines installed by hand 3. Slope Stability Report prepared by a registered professional 4. No benching 5. Trees with diameters greater than 6 inches not to be removed. 6. Minimum 36" soil depth below drip/leach lines or no evidence of saturation. 7. 75 ft (undeveloped parcels) or 50 ft (developed parcels) setback to cutbanks and/or unstable land forms
100 ft setback from leachfield to perennial watercourse	1. For developed parcels with no increase in flow, reduction to no less than 50 ft (setback will be the greatest possible and no closer than existing OWTS) with PRMD approved pretreatment unit 2. For developed parcels with a proposed increase in flow, reduction to no less than 50 ft (setback will be the greatest possible and no closer than existing OWTS) with PRMD approved pretreatment unit and disinfection unit.
50 ft setback from leachfield to ephemeral watercourse	1. For developed parcels, reduction to no less than 25 ft (setback will be the greatest possible) with PRMD approved pretreatment unit 2. For undeveloped parcels, reduction to no less than 40 ft (setback will be the greatest possible) with PRMD approved pretreatment unit 3. Or, existing piped watercourse to be encased in a watertight pipe with water tight joints 4. Or, adequate protective site specific conditions existing, such as physical settings with low hydrogeologic susceptibility from contaminant infiltration (e.g. evidence of confining layer(s), watercourse upgradient

50 ft setback from septic tank or sump to perennial stream, ocean, lake or reservoir	1. Waterproof surface barrier applied to concrete tank consistent with Manual of Concrete Practice ACI 515.1R 2. Flexible rubber boots or compression seals meeting ASTM C 1173 used for inlet and outlet connections to provide flexibility in case of tank settlement while still maintaining watertight seal. 3. An approved double wall fiberglass tank may be used in lieu of a concrete tank. 4. Tank leakage test
100 ft setback from well to leachfield	1. Reduction of setback to 50 ft for existing wells on same parcel. 2. New leachfield shall be no closer to the well than the leachfield that is being replaced (50 ft is a minimum, the setback will be the greatest possible). 3. Provide an approved non-standard OWTS or an approved pretreatment unit on a standard OWTS.
Installation of OWTS in fill material	Evaluation of structure, texture, consistency, pore space, percolation rate of fill material.
Property line setback reductions	1. Consultant and property owner clearly state in writing and on the approved OWTS plan that the location of the OWTS is clearly on his/her property. 2. If there is disagreement and the location is not clear, a survey of the property line is required.
Structure(s) setbacks	1. A reduction to a setback to a non-structural cement slab, path, patio, pool deck can be approved provided the setback reduction will not interfere with the performance of the OWTS. 2. Structural engineer certification that the tank or dispersal field will not impact the integrity of the structures foundation or cause pollution of the structure (e.g. pool, spa, pond) and that the access to the tank and dispersal field will not be impeded.
Installation of a Non-Standard OWTS in permeable soil below an impermeable soil lens	Provide an approved pretreatment unit.

Prohibition 4.2.C.6 Periodic Monitoring	Enrolled in the Operational Permit Program
Prohibition 4.2.C.8-9 Vertical Separation to Groundwater	Apply to the appropriate Regional Water Board for a set of waste discharge requirements, waiver of waste discharge requirements or a conditional waiver of waste discharge requirements.
Prohibition 4.2.C.11-12 Horizontal Separation from Water Sources	Utilize supplemental treatment to achieve treatment standards listed in Table 4-3.

Section 18 Variance Prohibition and Special Standards Areas

A. There are several areas in Sonoma County that are subject to variance prohibitions and/or special standard requirements. These areas include the following:

1. Camp Meeker

    a. Variance requests for new construction of structures on vacant lots and construction on existing structures that would result in an increase of flow prohibited.
    b. All applications approved by PRMD are subject to a condition that the structures involved will be connected to a community system when it becomes available.

2. Canon Manor Subdivision

    a. Permits/clearances for new construction of structures on vacant lots and/or construction on existing structures on OWTS that would result in an increase of flow prohibited.

3. Coastal Subdivisions of Carmet, Rancho del Paradiso, Salmon Creek, Sereno del Mar and the Community of Jenner

    a. Variance requests for new construction of structures on vacant lots and construction on existing structures that would result in an increase of flow prohibited.

4. Happy Acres Subdivision

    a. Lots of less than 30,000 sq ft unbuildable unless connected to the Happy Acres Water System.
    b. All standard OWTS with intercept drains shall be designed by a Qualified Consultant.
    c. If wet weather percolation testing required, no variances allowed.

5. Larkfield-Wikiup Area

    a. Septic system prohibition area Mayfield Dr., Ascot Dr., Fairly Dr., Eton Ct., Devon Ct.

6. Monte Rio

    a. Variance requests for new construction of structures on vacant lots and construction on existing structures that would result in an increase of flow prohibited.

7. Penngrove/South Cotati

a. Variance requests of wet weather percolation requirements prohibited.

8. West Petaluma Area

   a. All lots subject to 7.5 and 7.11 wet weather percolation testing and groundwater determination requirements.
   b. An interceptor drain shall be provided on all lots that have not had wet weather groundwater determinations (e.g. lots with slope>5%).
   c. Lack of a confining layer in which to bed an interceptor drain will result in the need for wet weather groundwater determinations.
   d. Areas which exhibit spring activity or potential wintertime seepage shall be subject to wet weather groundwater determinations.

9. Russian River Meadows Subdivision Units 1 & 2 (aka Rein's Beach)

   a. Wet weather testing may be conducted when observed water levels ranges from 0"-12" below ground surface in the groundwater monitoring wells located on APN096-211-017 (22800 Conifer).
   b. Except for the above noted provision, variance requests for new construction of structures on vacant lots and construction on existing structures that would result in an increase of flow prohibited.

10. South Wright Area

   a. Variance requests for new construction of structures on vacant lots and construction on existing structures that would result in an increase of flow prohibited.
   b. No permits and/or clearances for property improvement, land division or change in use. in the "septic tank ban area" shall be granted unless connection to sewer is included in the proposed application

11. Thomas Larkin Woods Subdivision Unit 1

   a. Variance requests for new construction of structures on vacant lots and construction on existing structures that would result in an increase of flow prohibited.

12. Westvue Meadows Subdivision

   a. Compliance with depth to groundwater requirements (without variance), required on all lots, regardless of slope.

B. Sonoma Creek is subject to the approved 2010 Pathogen TMDL Implementation Plan.

C. RWQCB Impaired Water Bodies for Pathogens subject to Tier 3 Impaired Areas

1. TMDL Completion Date 2016

   a. Mainstem Russian River from Fife Creek to Dutch Bill Creek, Green Valley

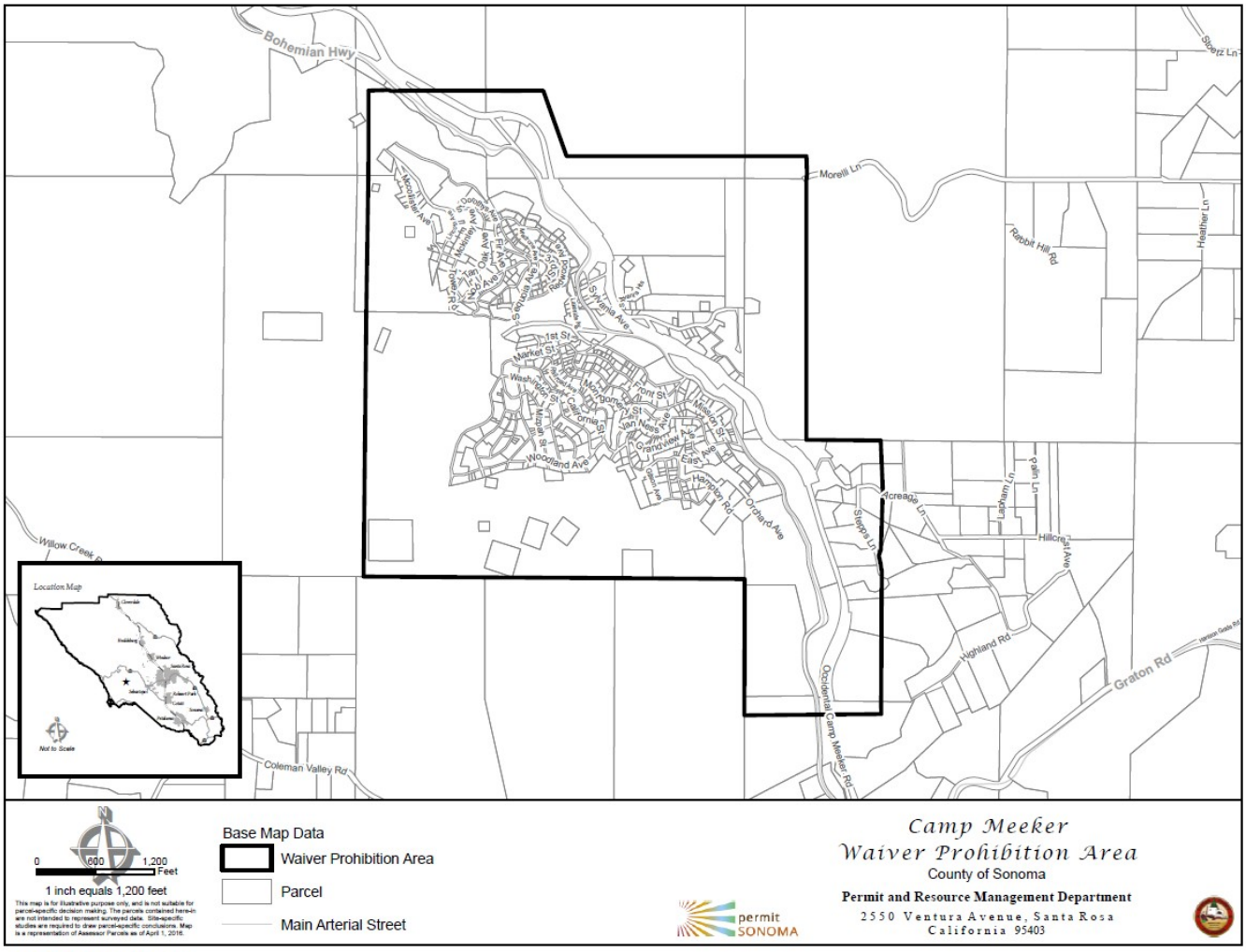
Creek watershed, Russian River at Healdsburg Memorial Beach and unnamed tributary at Fitch Mountain, mainstem Laguna de Santa Rosa, mainstem Santa Rosa Creek. (See LAMP Part 1, Appendix C and Part 3 Advanced Protection Management Plan).

2. TMDL Completion Date 2017

   a. Petaluma River, Petaluma River (tidal portion).

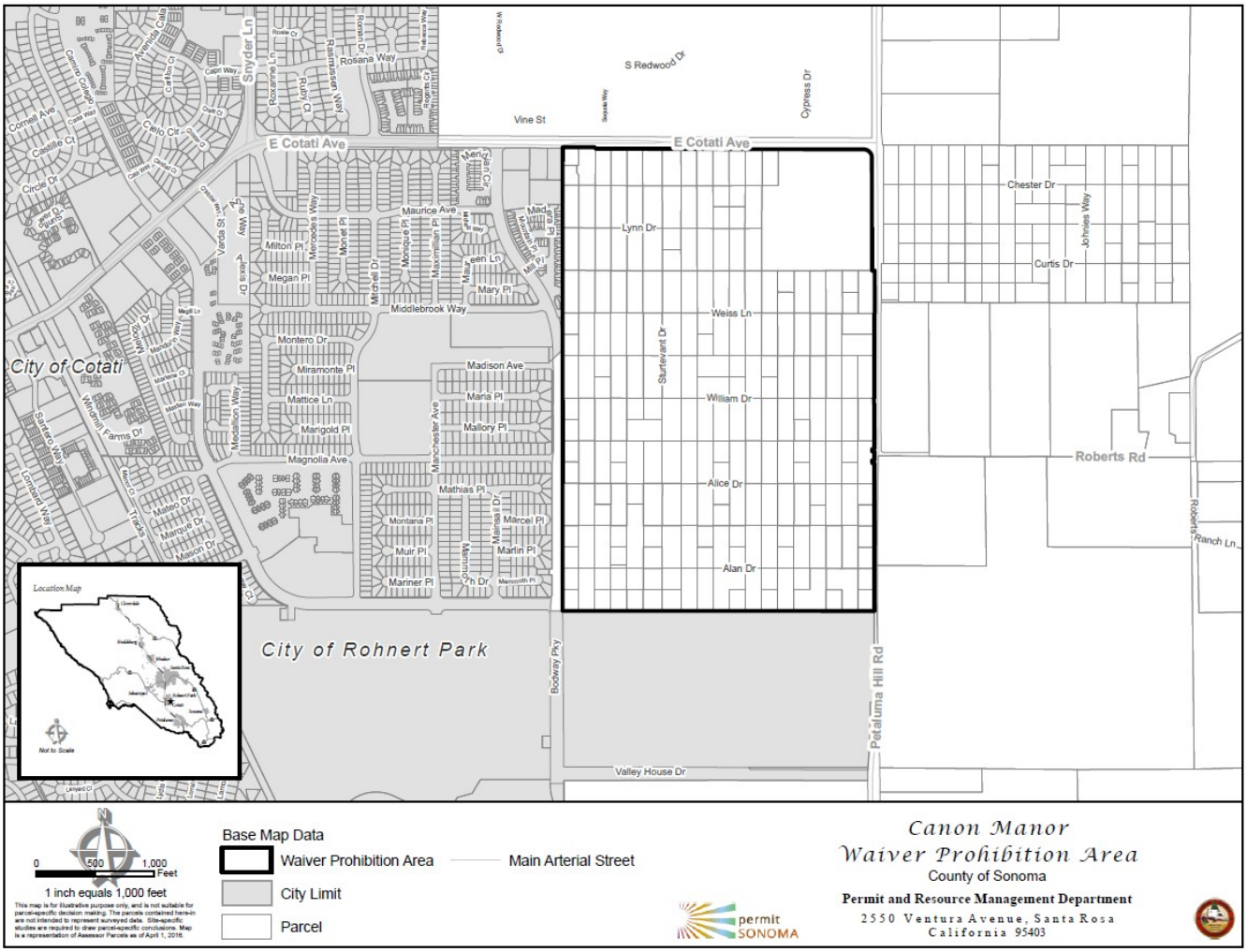
D. Refer to Maps18.1-13 for areas subject to this Section.

Map 18.1 Camp Meeker



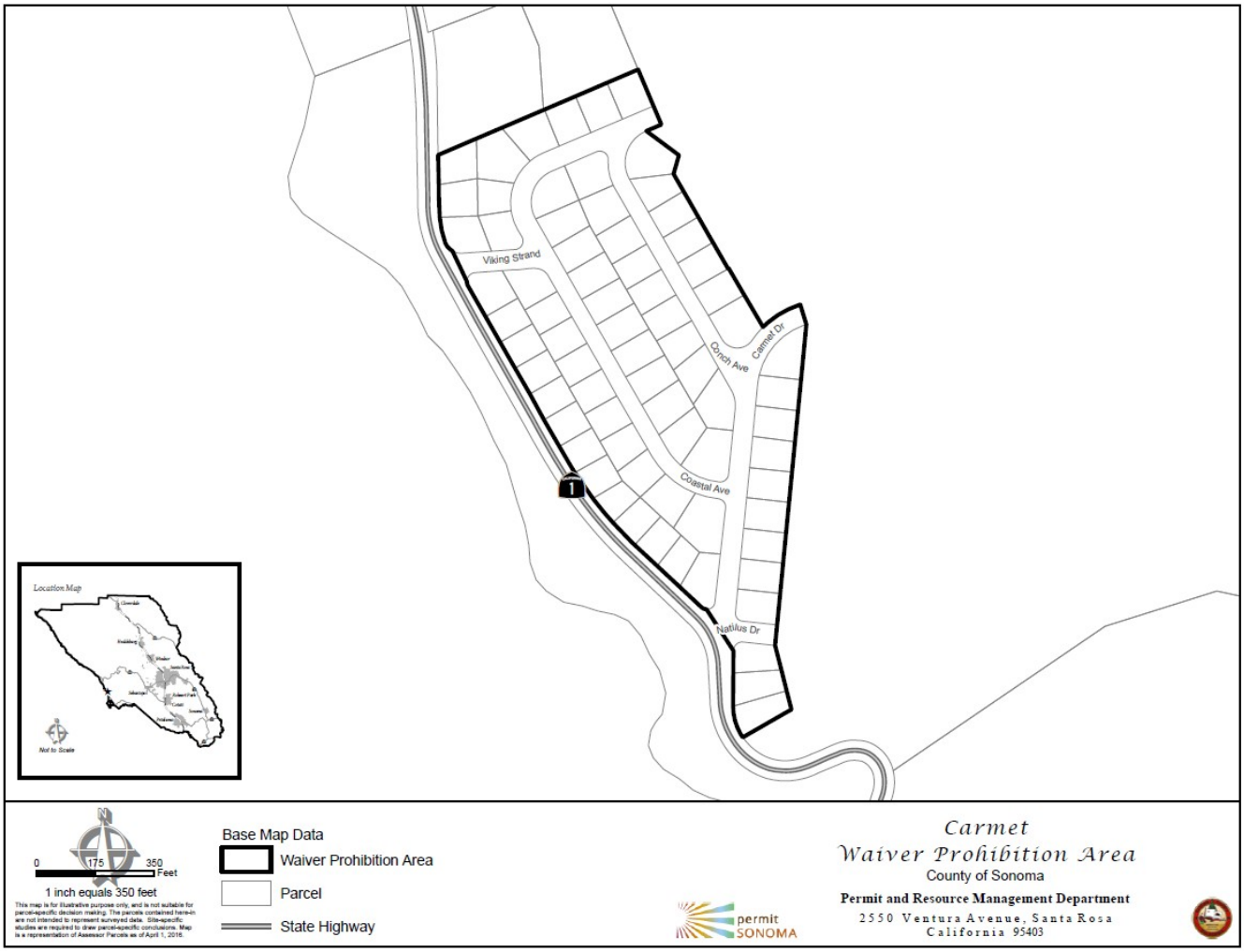
Author: PRMD GIS Date: April 14, 2016

Map 18.2 Canon Manor



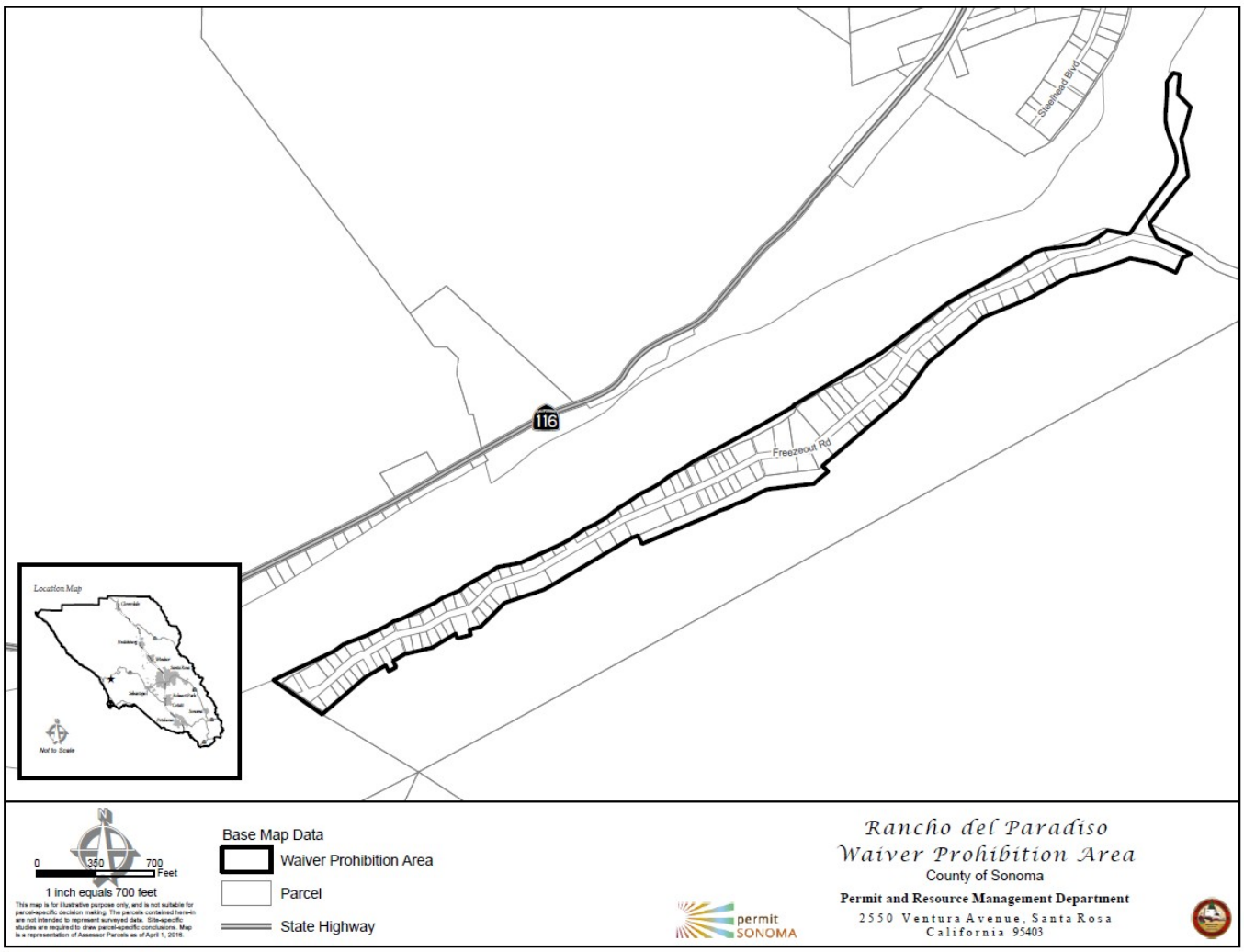
Author: PRMD GIS Date: April 14, 2016

Map 18.3a Carmet



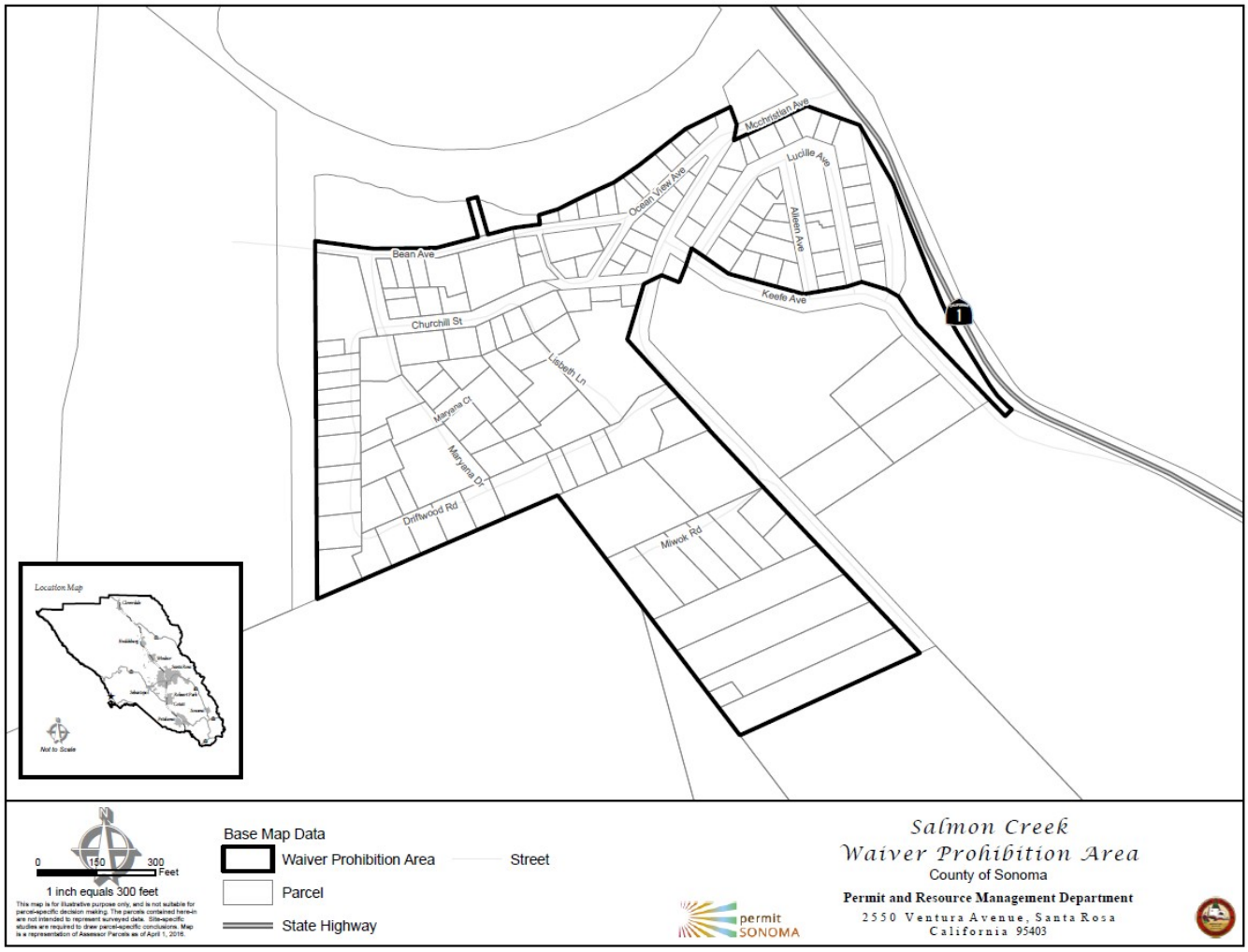
Author: PRMD GIS Date: April 14, 2016

Map 18.3b Rancho del Paradiso



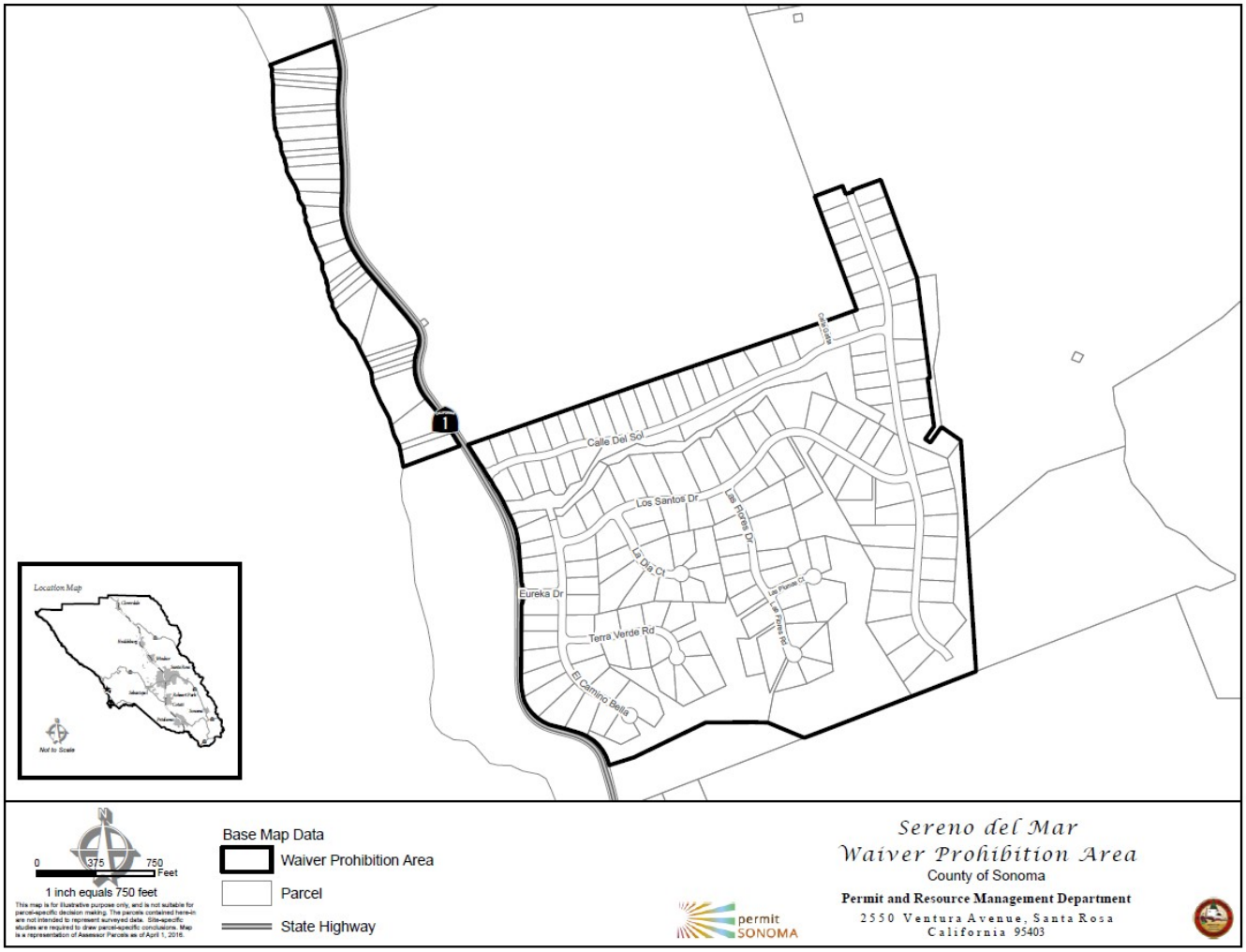
Author: PRMD GIS Date: April 14, 2016

Map 18.3c Salmon Creek



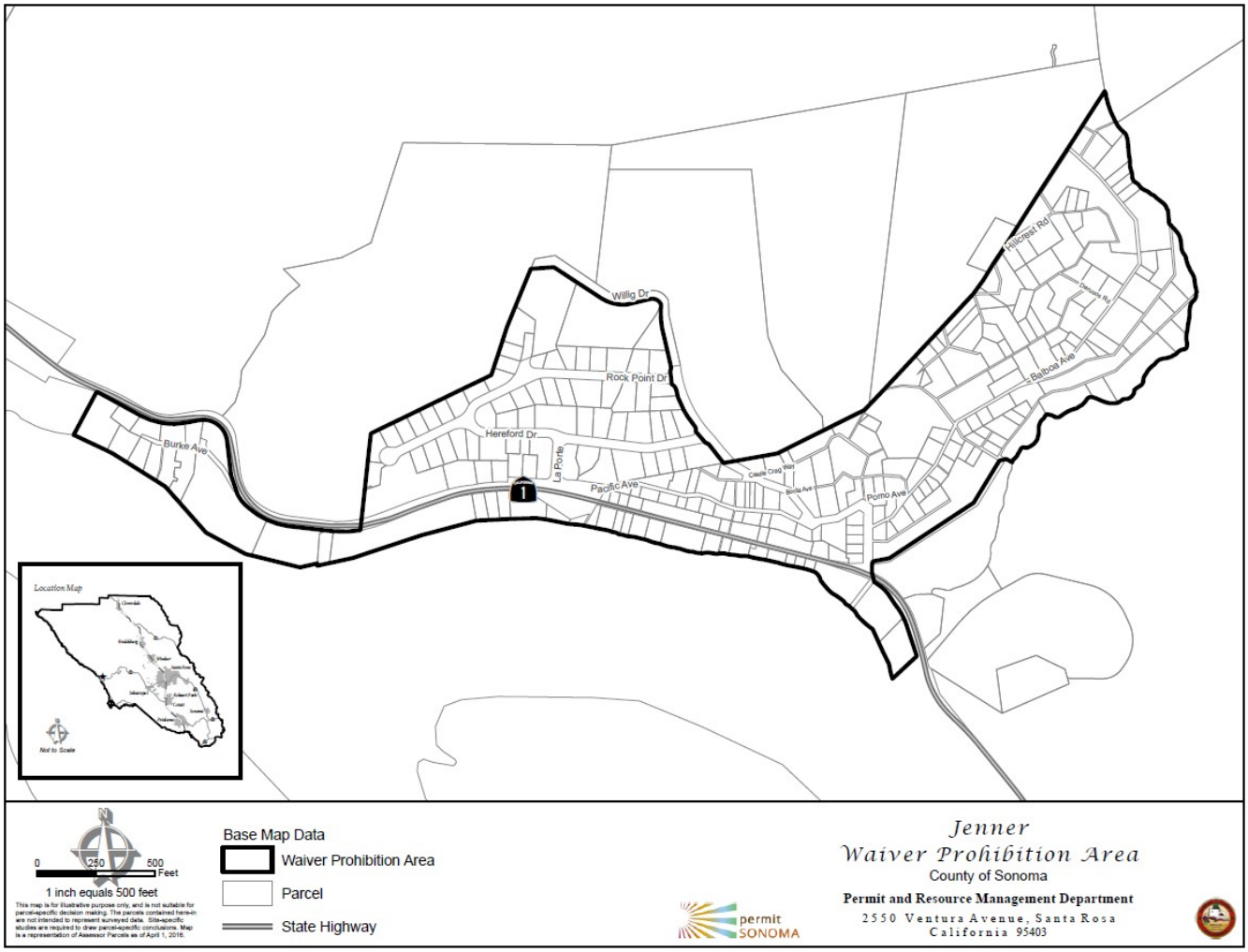
Author: PRMD GIS Date: April 14, 2016

Map 18.3d Sereno del Mar/Gleason's Beach



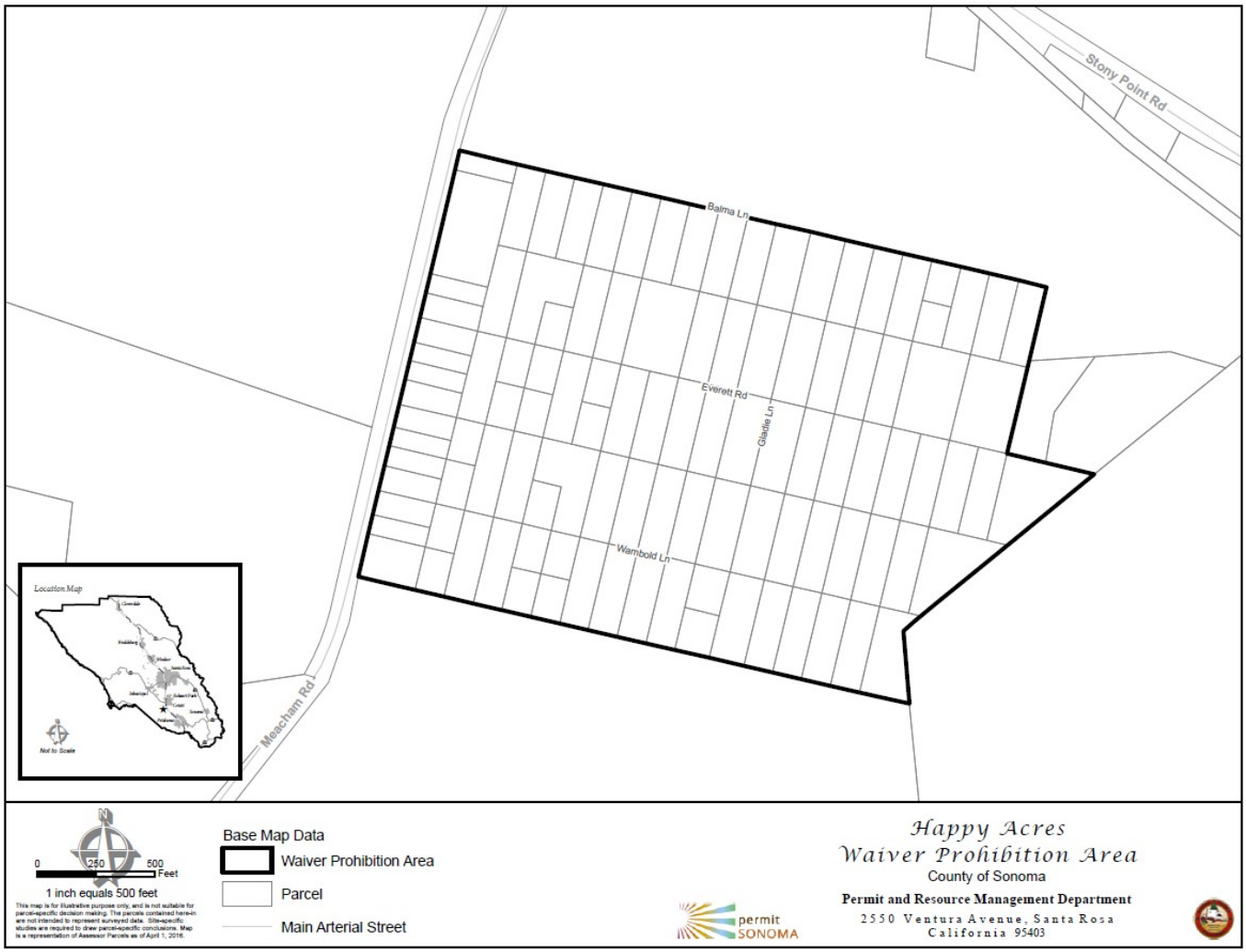
Author: PRMD GIS Date: April 14, 2016

Map 18.3e Jenner



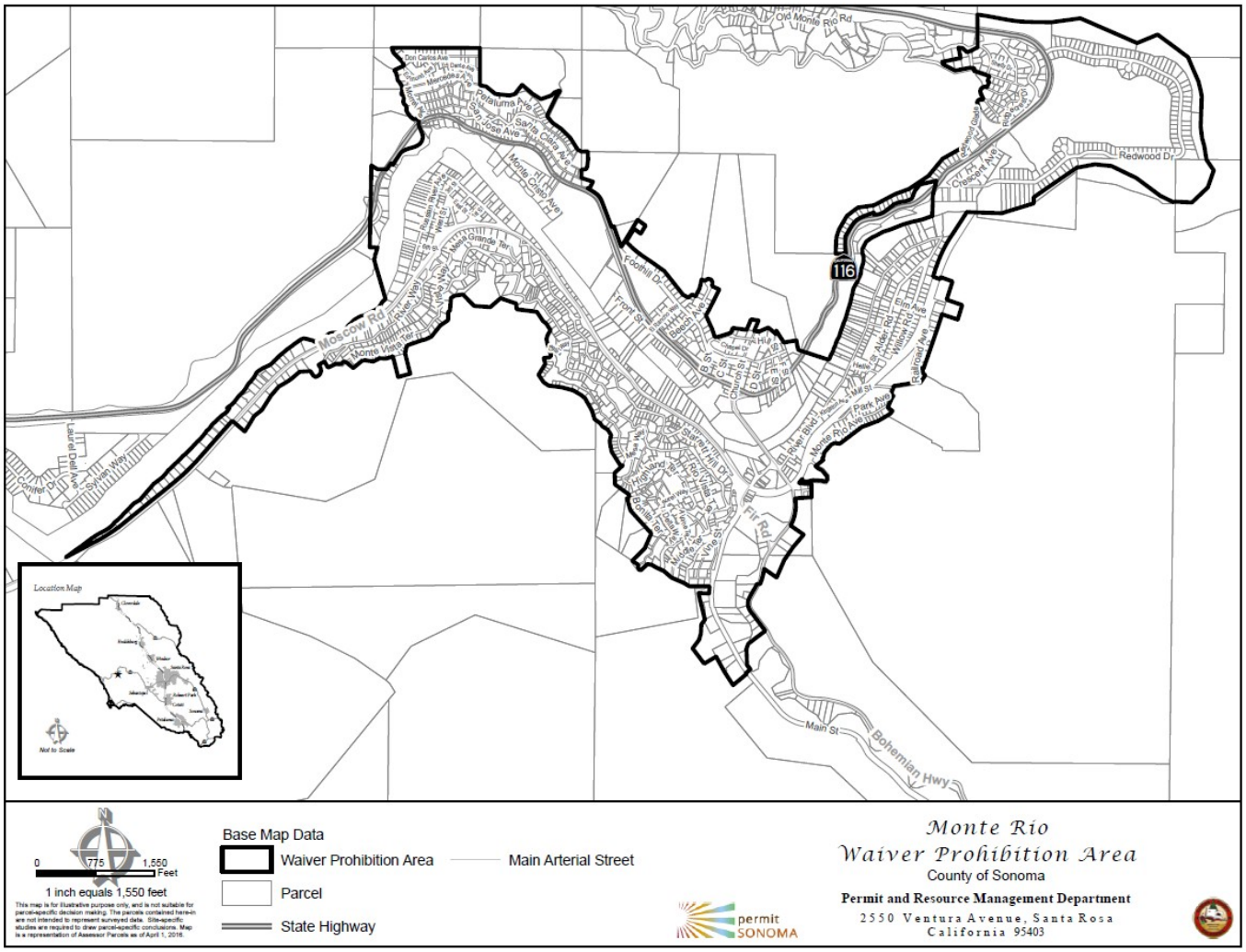
Author: PRMD GIS Date: April 14, 2016

Map 18.4 Happy Acres



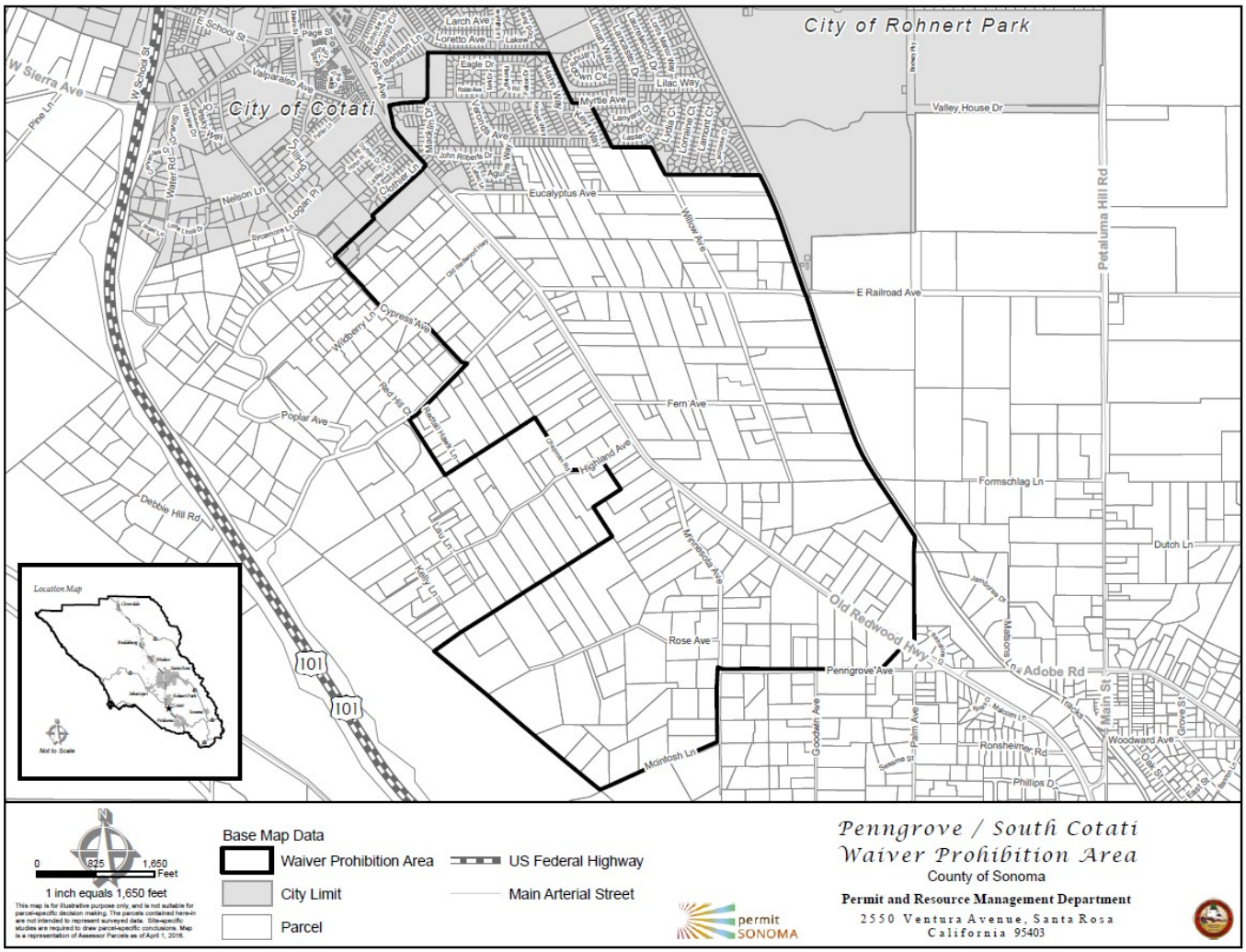
Author: PRMD GIS Date: April 14, 2016

Map 18.5 Monte Rio



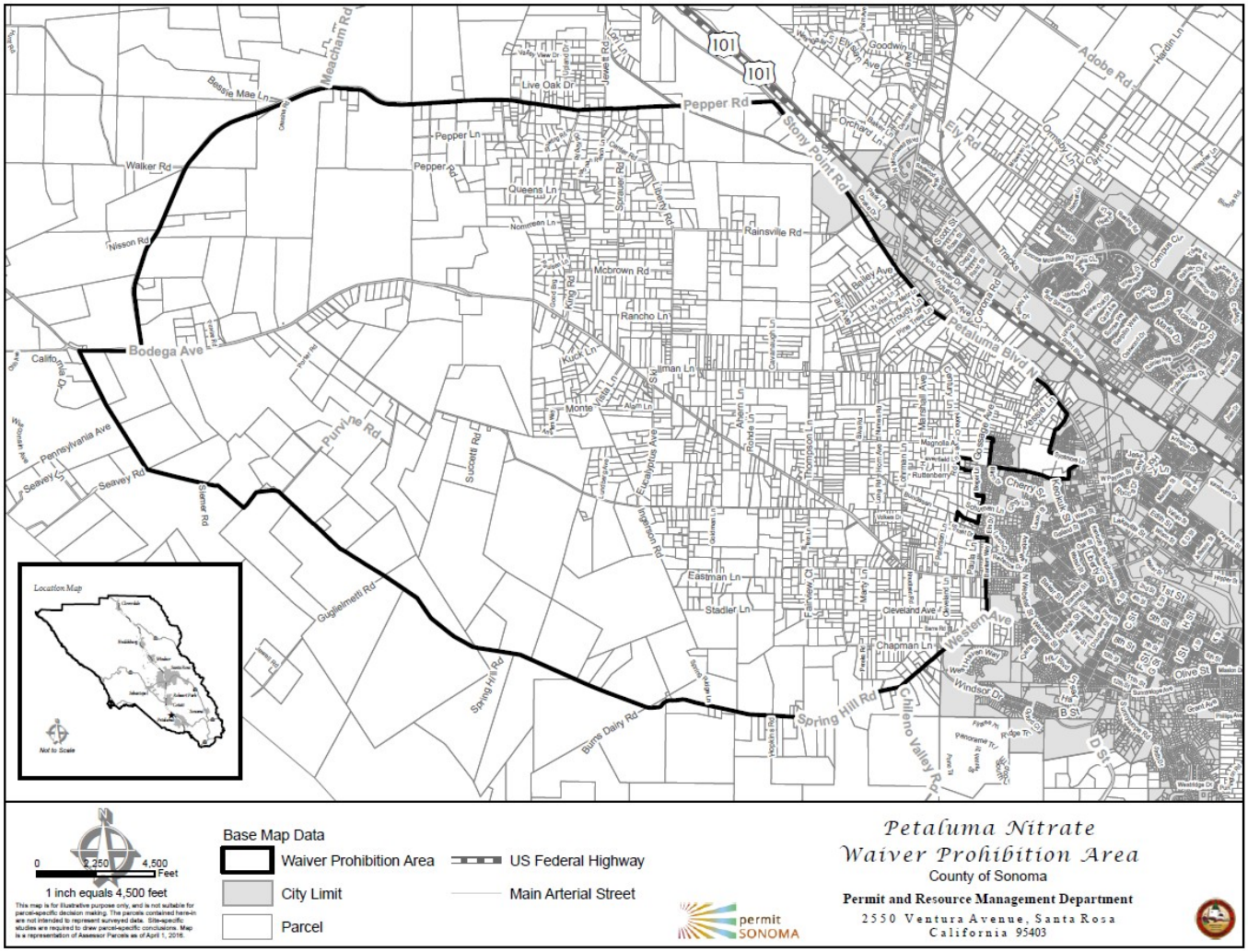
Author: PRMD GIS Date: April 14, 2016

Map 18.6 Penngrove/South Cotati



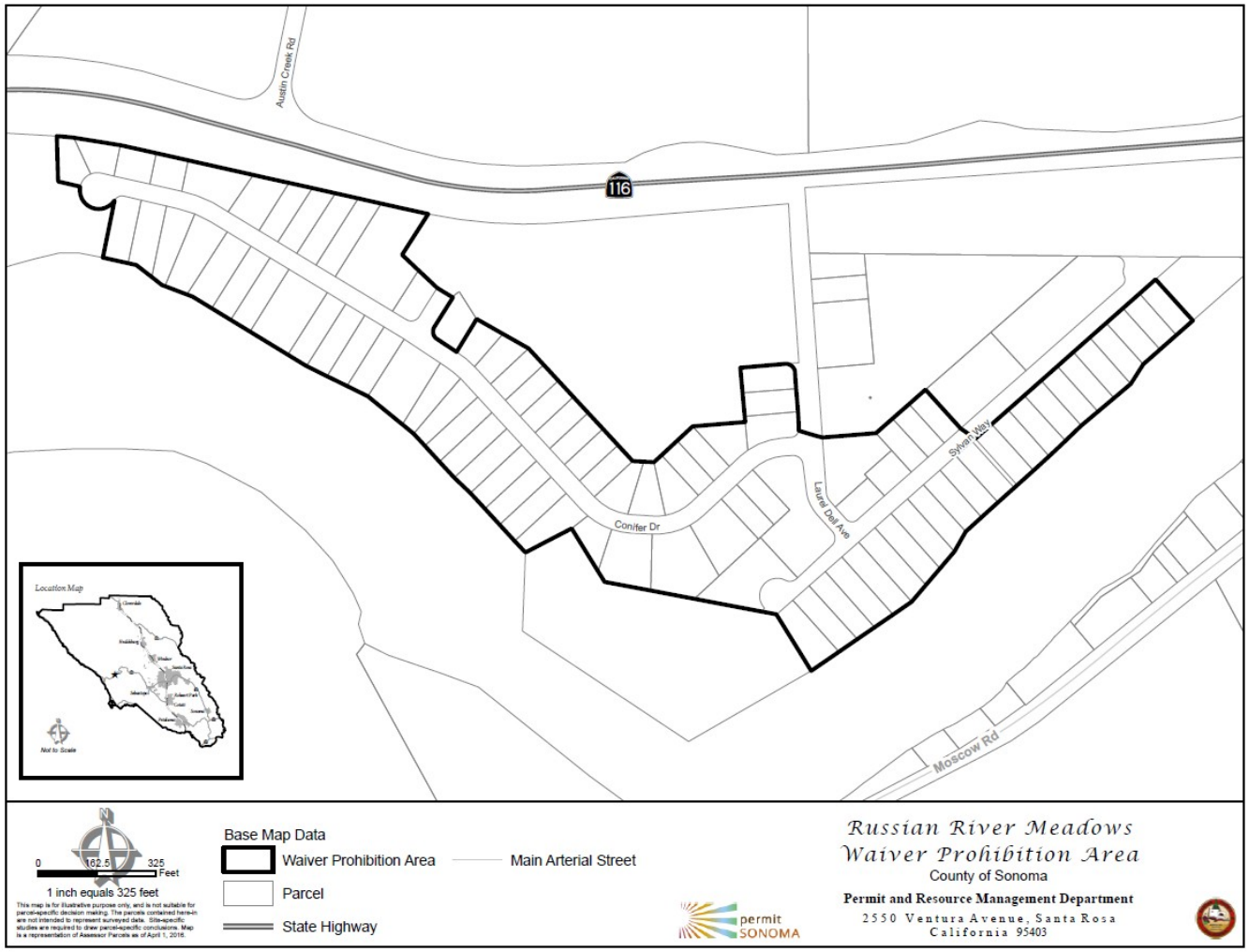
Author: PRMD GIS Date: April 14, 2016

Map 18.7 West Petaluma



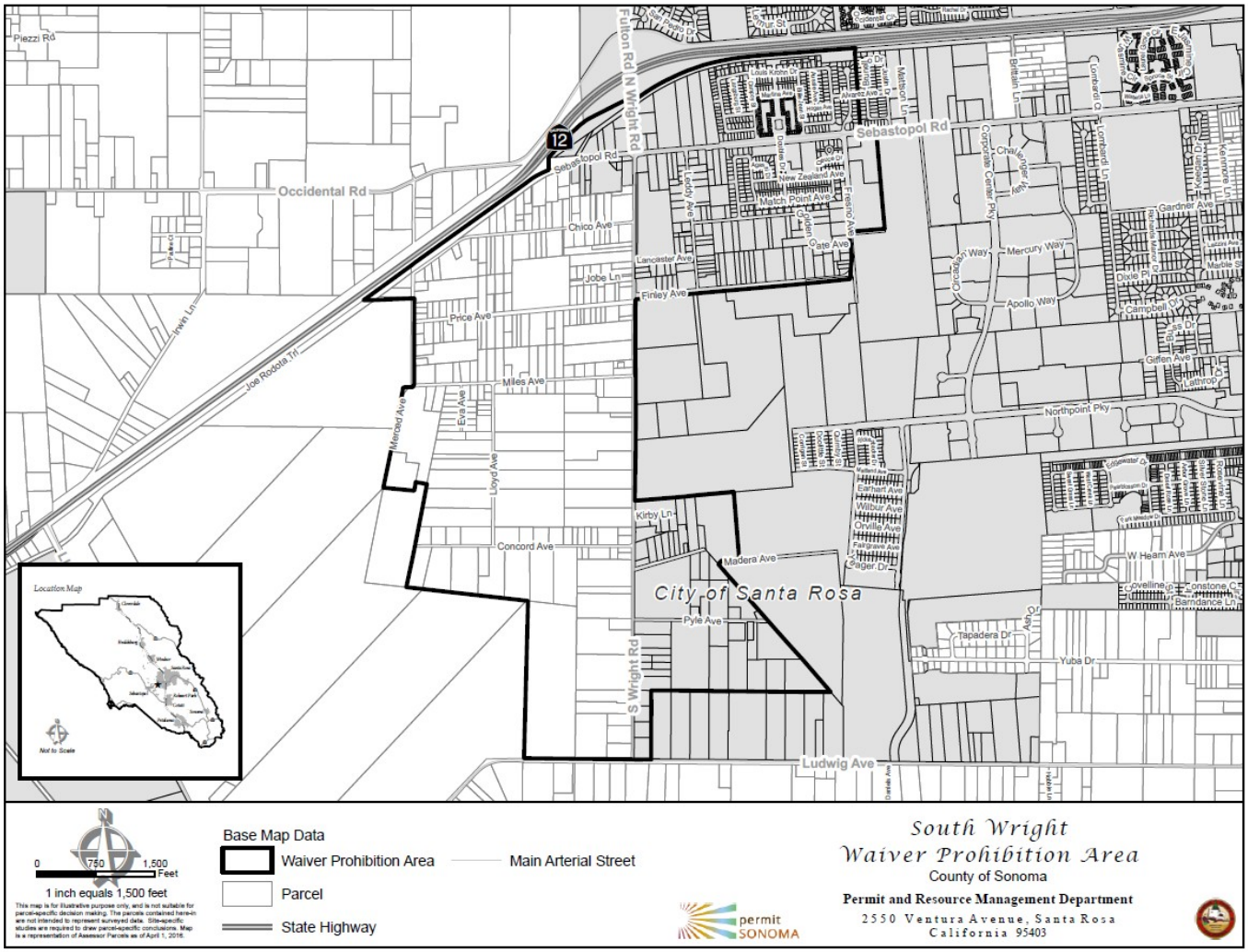
Author: PRMD GIS Date: April 14, 2016

Map 18.8 Russian River Meadows



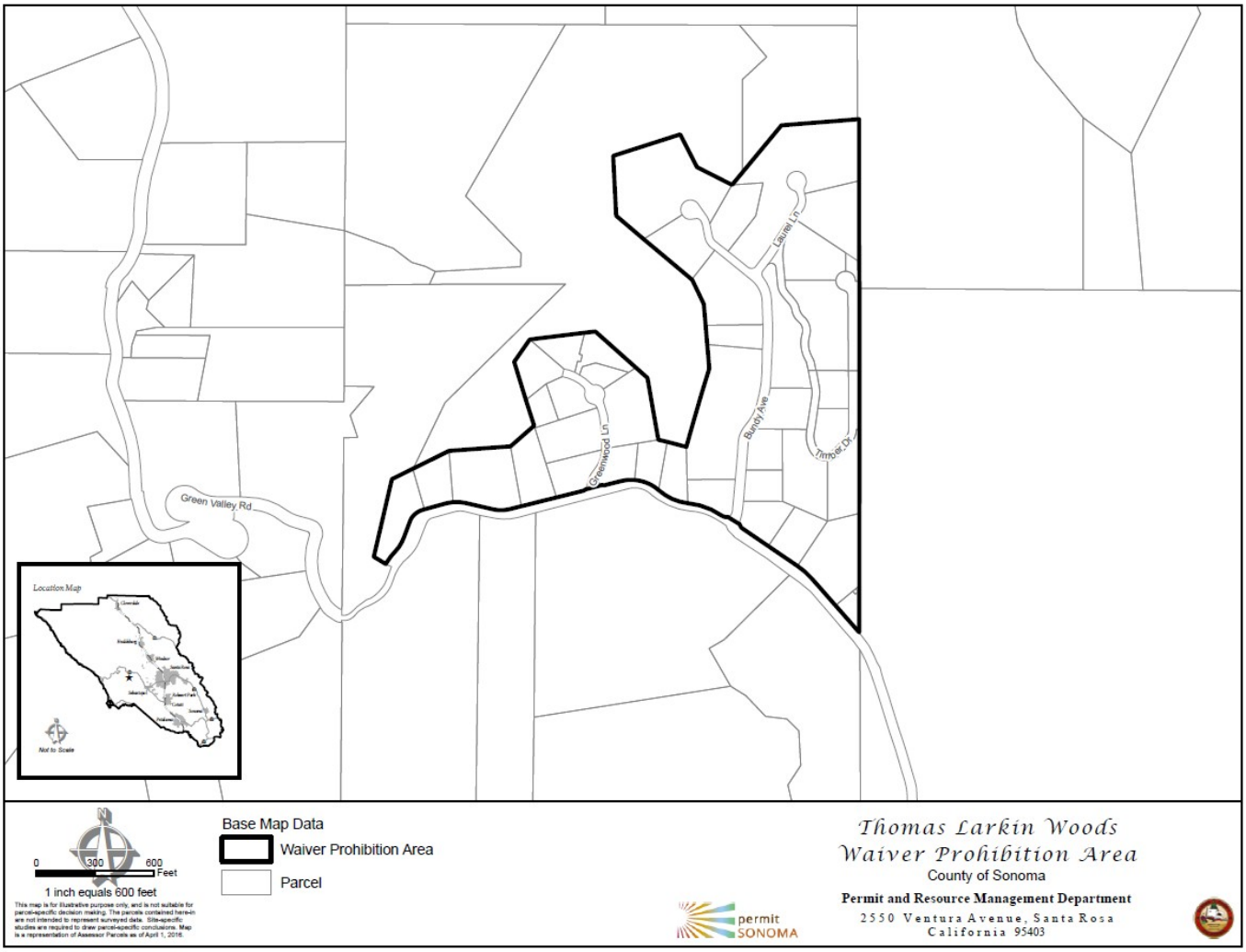
Author: PRMD GIS Date: April 14, 2016

Map 18.9 South Wright Road



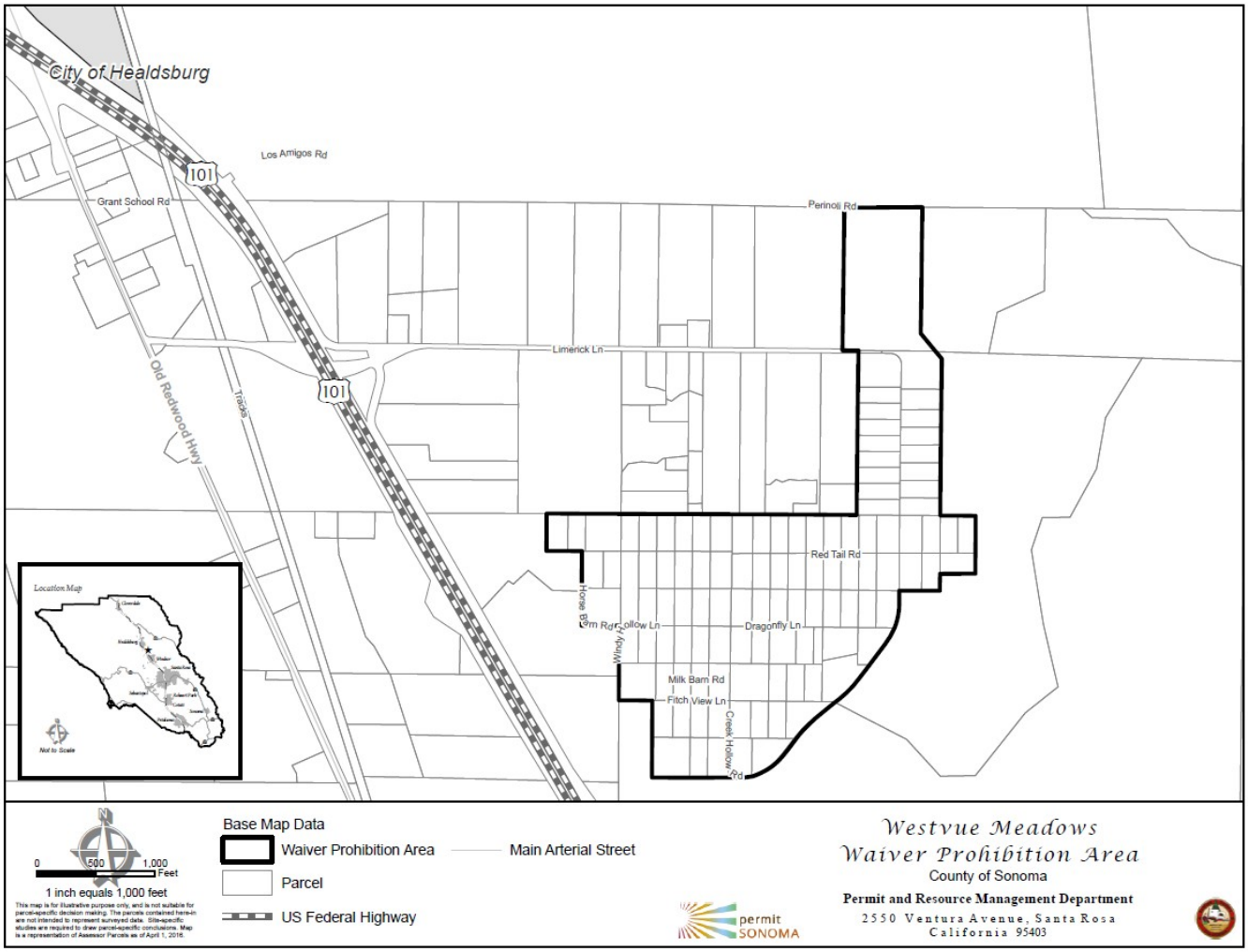
Author: PRMD GIS Date: April 14, 2016

Map 18.10 Thomas Larkin Woods



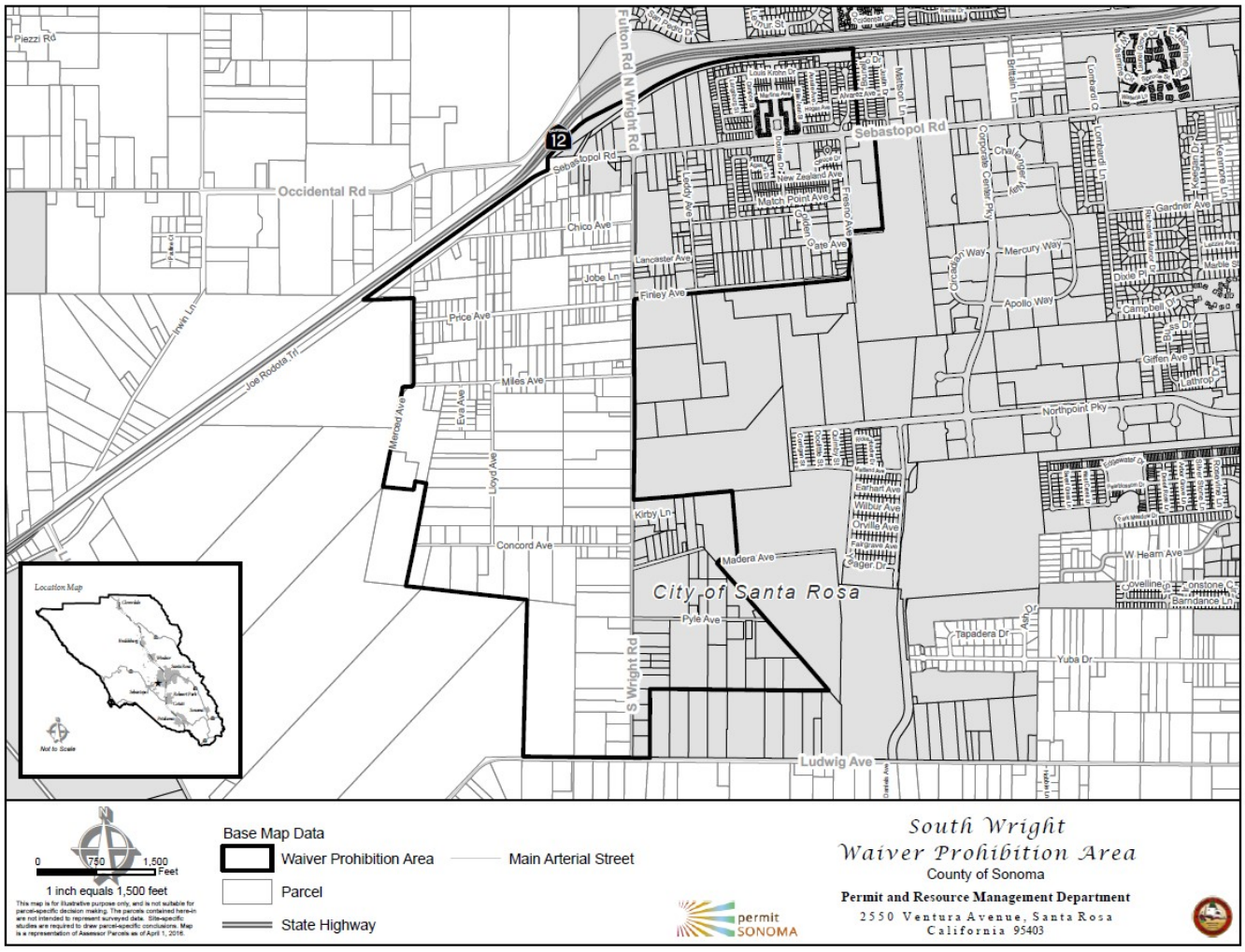
Author: PRMD GIS Date: April 14, 2016

Map 18.11 Westvue Meadows



Author: PRMD GIS Date: April 14, 2016

Map 18.12 S Wright Septic Ban Area



Author: PRMD GIS Date: April 14, 2016

Section 19 Dispute Resolution

A. In those instances when the findings and/or documents submitted by an Applicant are not approved by PRMD staff and differences cannot be resolved at the staff level, applicant may appeal the staff's decision to the Division Supervisor. Appeal of the Supervisor's decision shall be made to the Division Manager.

B. Pursuant to BOS Resolution 97-1098, if a resolution cannot be accomplished at the administrative level, the Applicant may have staff's decision reviewed by a Dispute Resolution Panel (DRP). The Applicant shall prepare and submit appropriate documents, including the Dispute Resolution processing fee, to the PRMD Director. The Director will set a date for the review within five (5) days of the request.

C. The DRP shall be appointed by the Land Use Advisory Panel (LUAP) and consist of six (6) persons familiar with County policies and regulations one (1) RCE, one (1) REHS, one (1) licensed real estate individual, one (1) Class A General Engineering or C-42 Sanitation System licensed contractor, one (1) C-57 water well licensed contractor and one (1) citizen at large. A quorum of four panel members is necessary to convene a meeting and to vote on a recommendation.

D. The DRP is to review the materials submitted, offer an impartial analysis, and recommend approval or denial of the Applicant's appeal. The DPR does not have the authority to modify or alter adopted standards. The PRMD Director will review the DPR's recommendation before making a determination. The Director's decision is final. The PRMD Director shall notify the Applicant and DRP members of his/her decision and the basis for the decision, within 10 working days of the hearing.

Section 20 Tier 3 Treatment, Monitoring, Inspection and Sampling for Supplement Treatment Units

This section addresses the treatment, monitoring, inspection and sampling requirements for supplemental treatment units subject to the OWTS Policy, section 10, that are located outside of the geographical area defined by either a TMDL implementation plan or an Advanced Protection Management Program.

A. Supplemental treatment units for pathogens shall be capable of producing effluent that meets the following effluent quality parameters:

    1. Less than or equal to 30 mg/L Total Suspended Solids as a 30 -day average.

    2. Less than or equal to 200 Most Probable Number per 100 milliliters for fecal coliform bacteria.

B. Supplemental Supplemental treatment units for nitrogen shall be capable of producing effluent that reduces the nitrogen levels 50% or more when comparing the 30-day average influent nitrogen levels to the 30-day average effluent nitrogen levels.

C. Supplemental treatment units shall be monitored in accordance with the operation and maintenance manual for the treatment unit.

D. Supplemental treatment components shall be equipped with a visual or audible alarm as well as a telemetric alarm that alerts the owner and service provide in the event of a system malfunction. Where telemetry is not possible, the owner or owner's agent shall inspect the system at least monthly while the system is in use.

E. Disinfection systems shall be inspected quarterly by a service provider for proper operation while the system is in use unless a telemetric monitoring system is capable of continuously assessing the operation of the disinfection system.

F. Sampling and analytical testing of disinfected effluent shall be conducted quarterly. The analytical testing shall be performed by a laboratory certified by the California Department of Public Health. The analytical test shall have a minimum detection level of 2.2 MPN. The effluent shall be tested for fecal coliform bacteria and total suspended solids. The location of the effluent sampling point shall be documented with geographic coordinates.